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OUR 63rd YEAR

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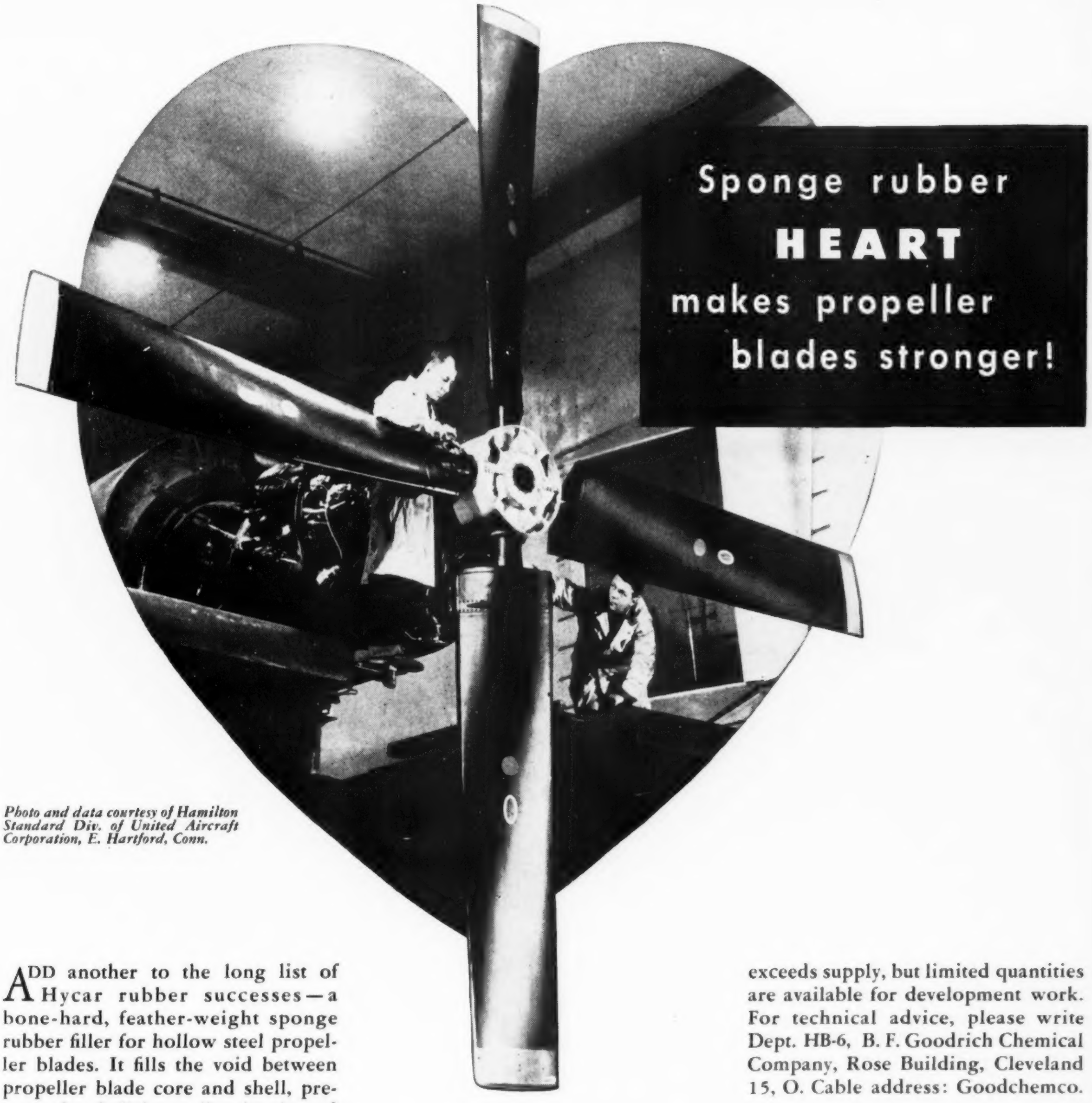

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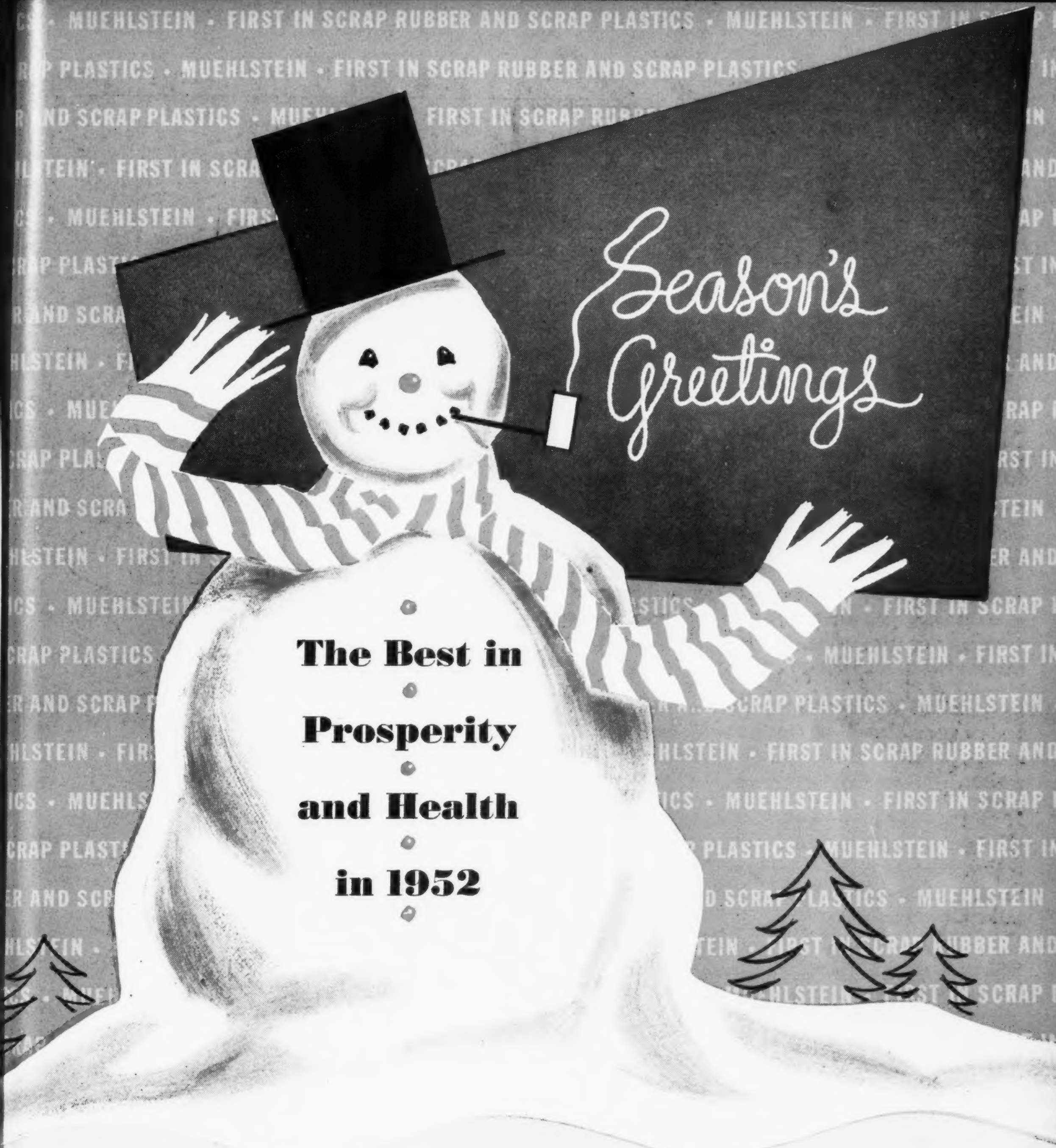
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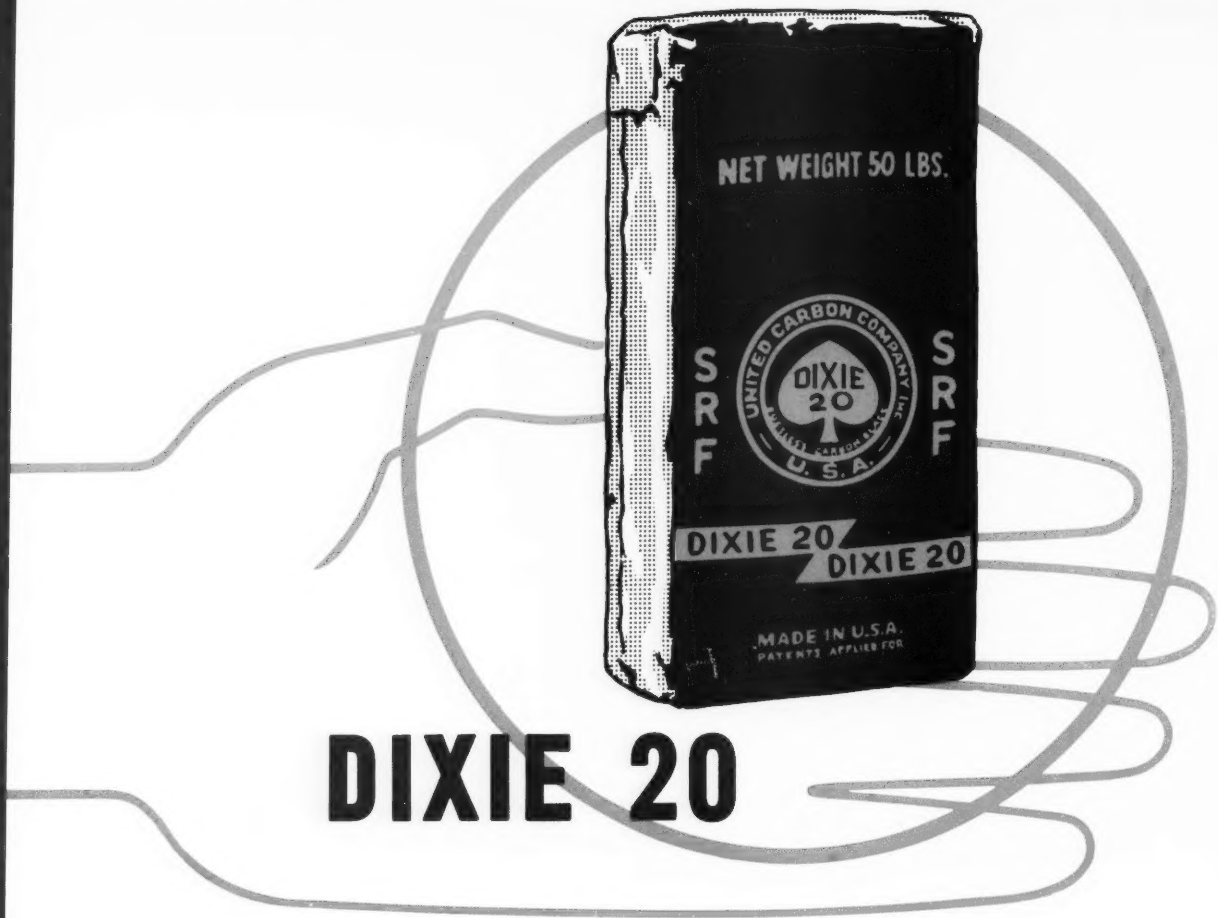

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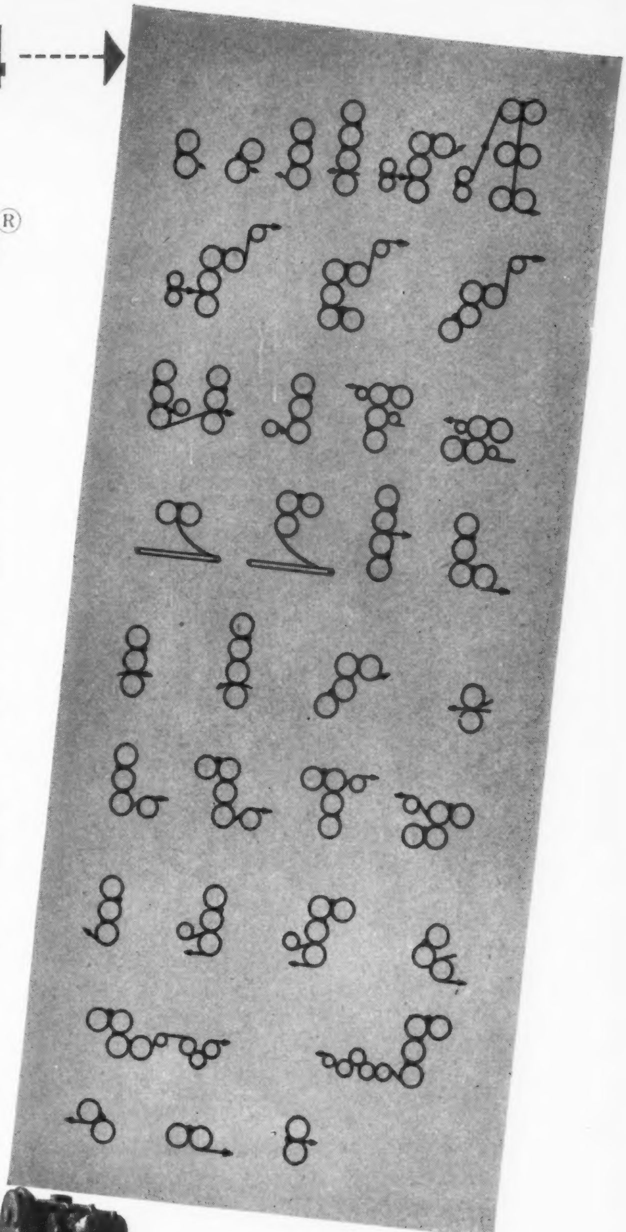

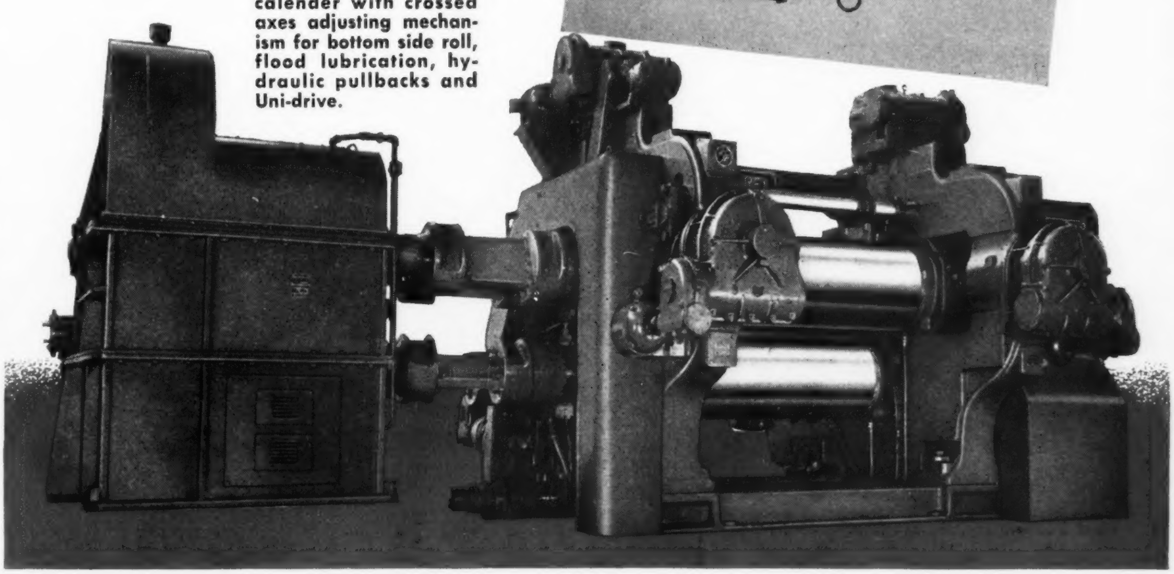

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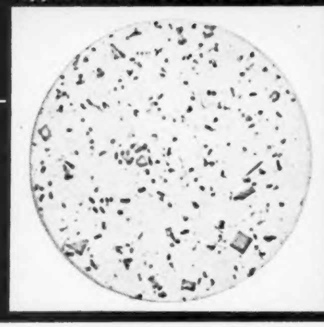

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Percent fines under .50 micron	16.0
Specific gravity	5.65
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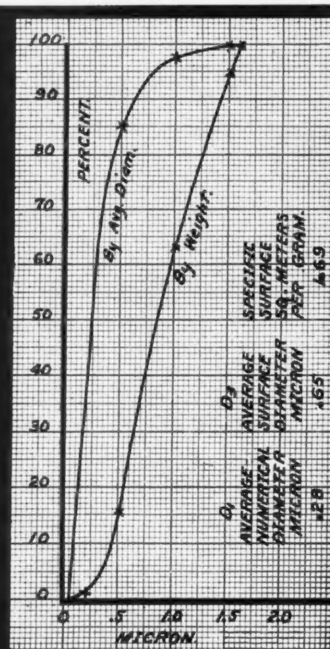
Percent thru 325 mesh screen	99.97



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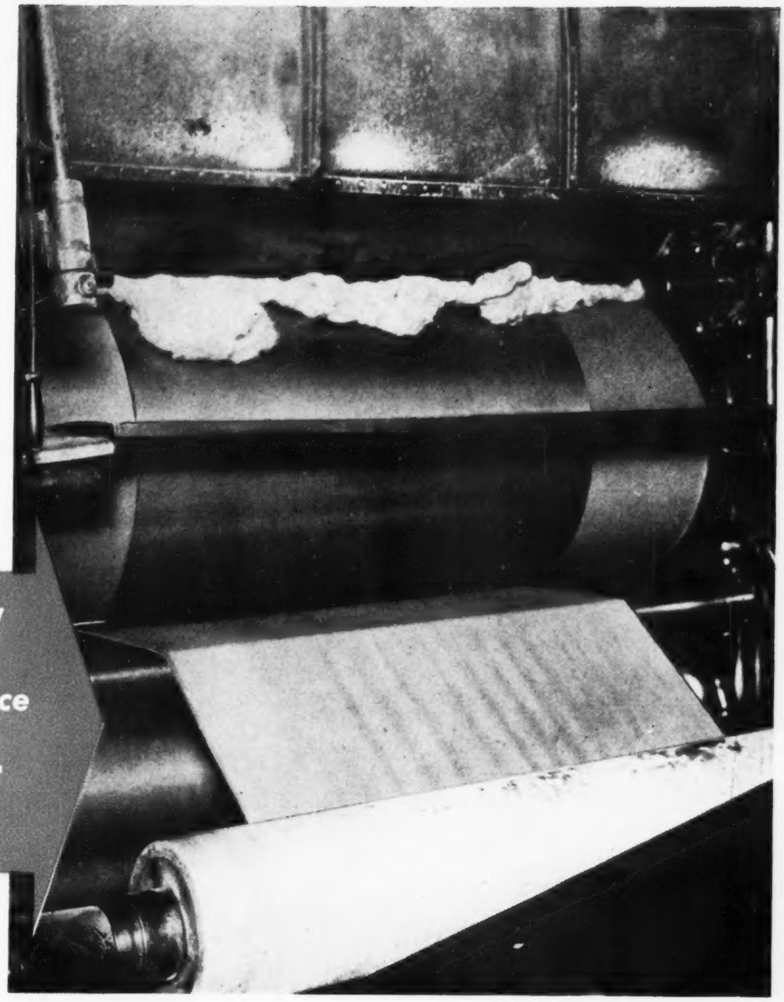


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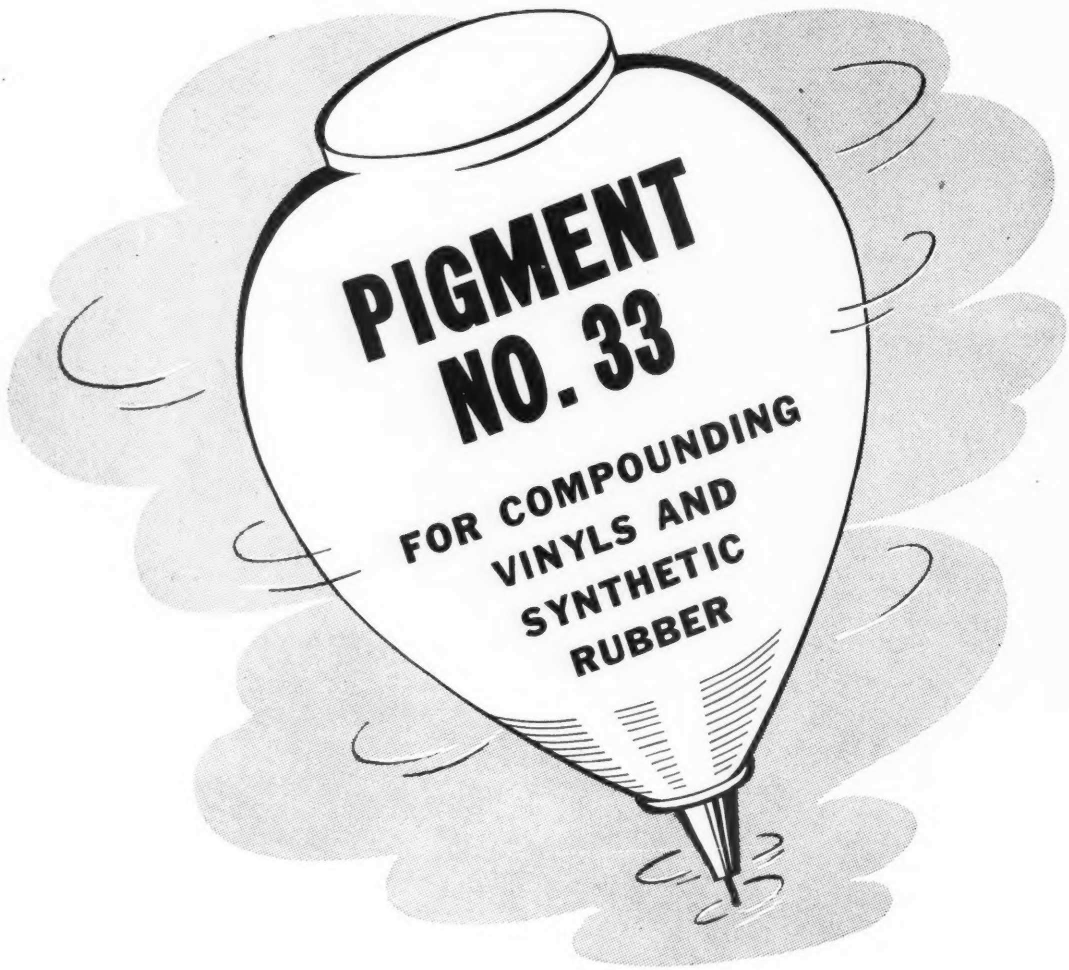

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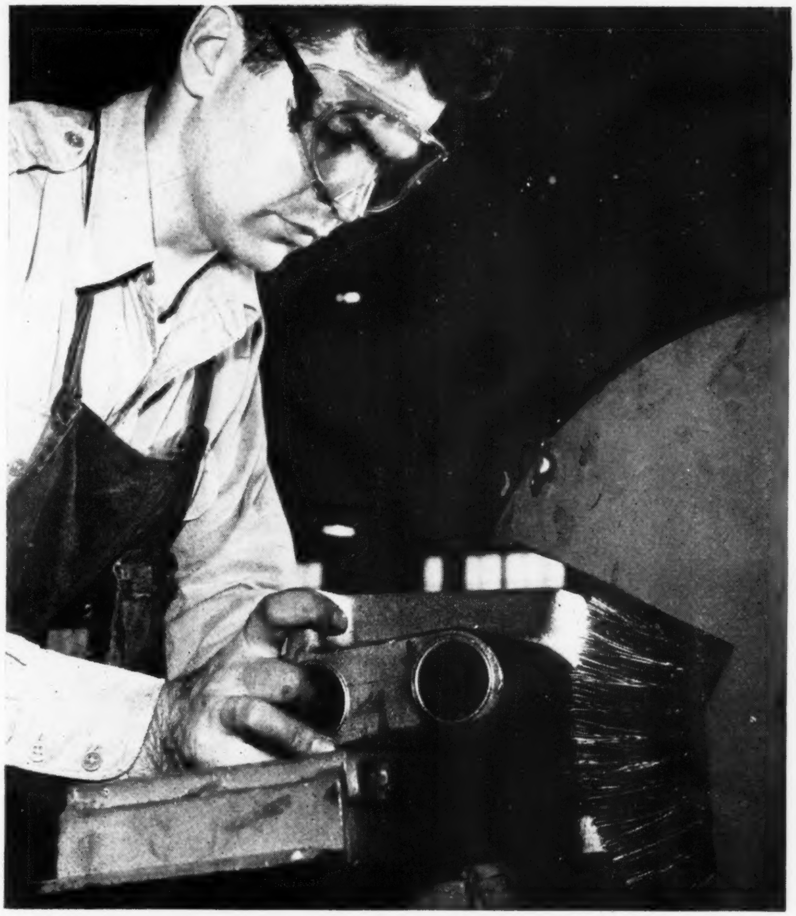
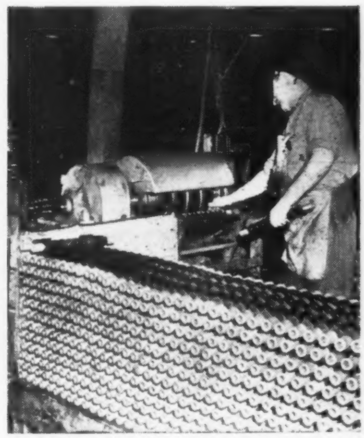


THE FIGHTING MACHINE. Tanks of this type are equipped with track shoes of the type shown at the left . . . also with pins which are cleaned as shown below.



THE BRUSHING MACHINE. Molded track pins are fed in one at a time. An Osborn Disc-Center Wire Wheel Brush meshes with each of six sections where flash and film are to be removed. Areas are cleaned thoroughly in a few seconds and pin is discharged.

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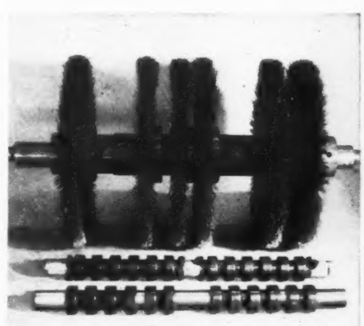

THE BRUSH SET-UP. This photo shows construction of arbor with six Osborn Brushes spaced to fit into track pin grooves where rubber is to be removed. In the foreground are track pins before and after brushing.

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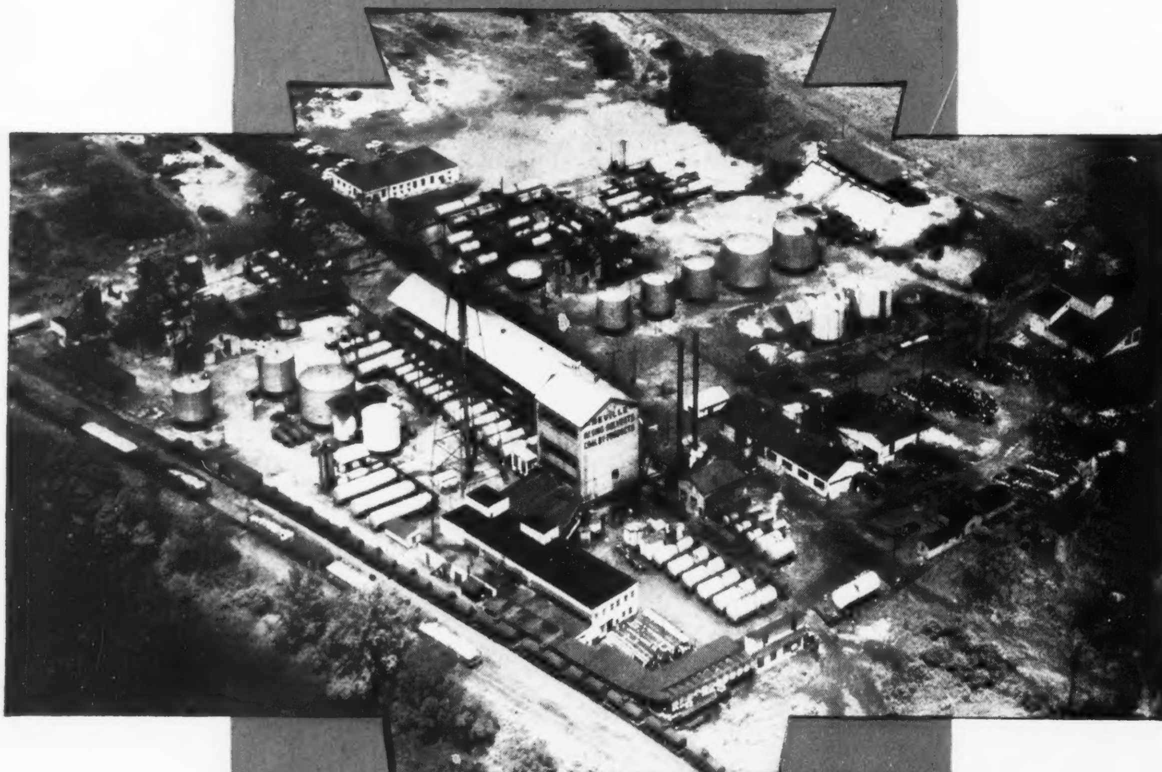

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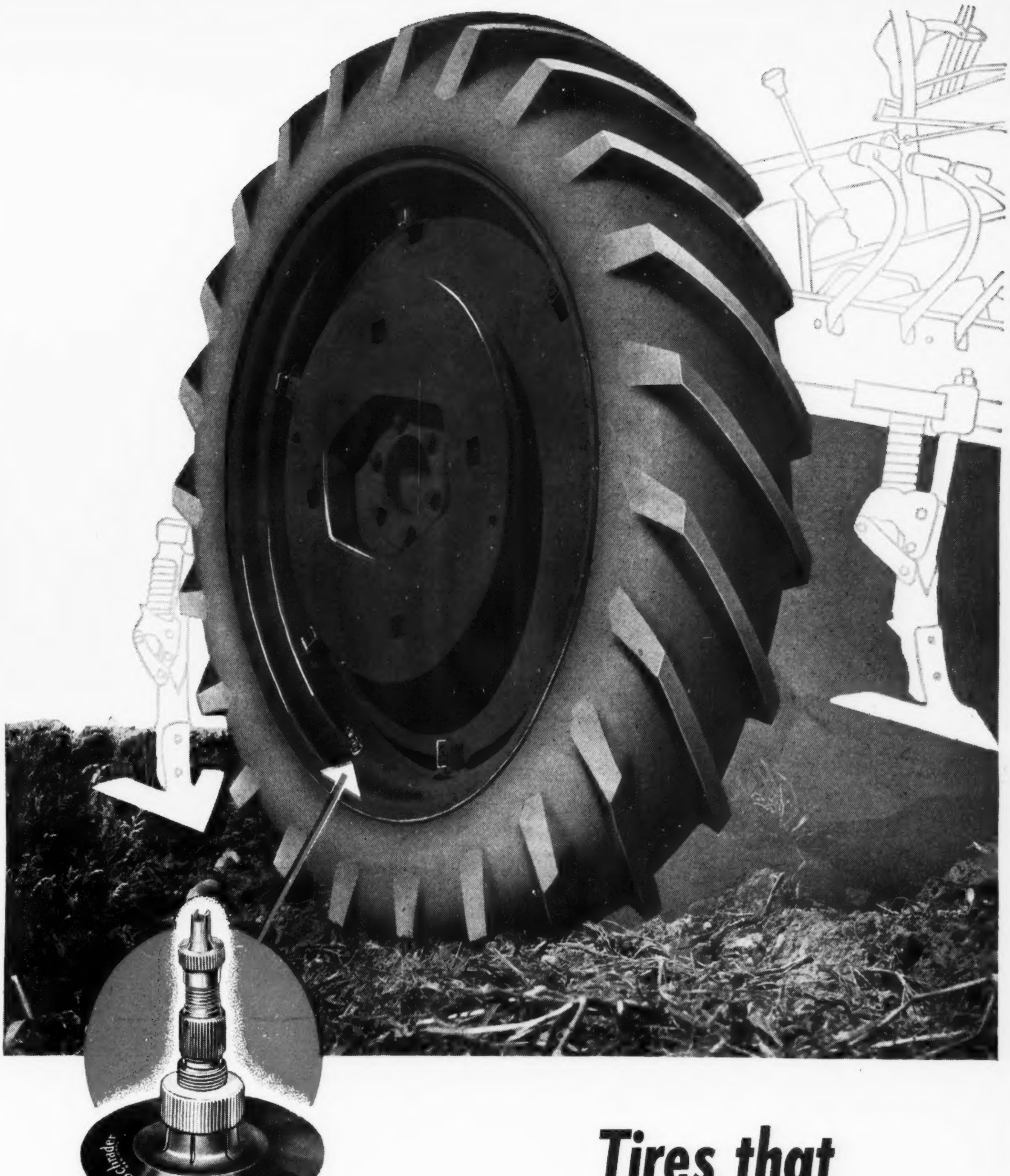
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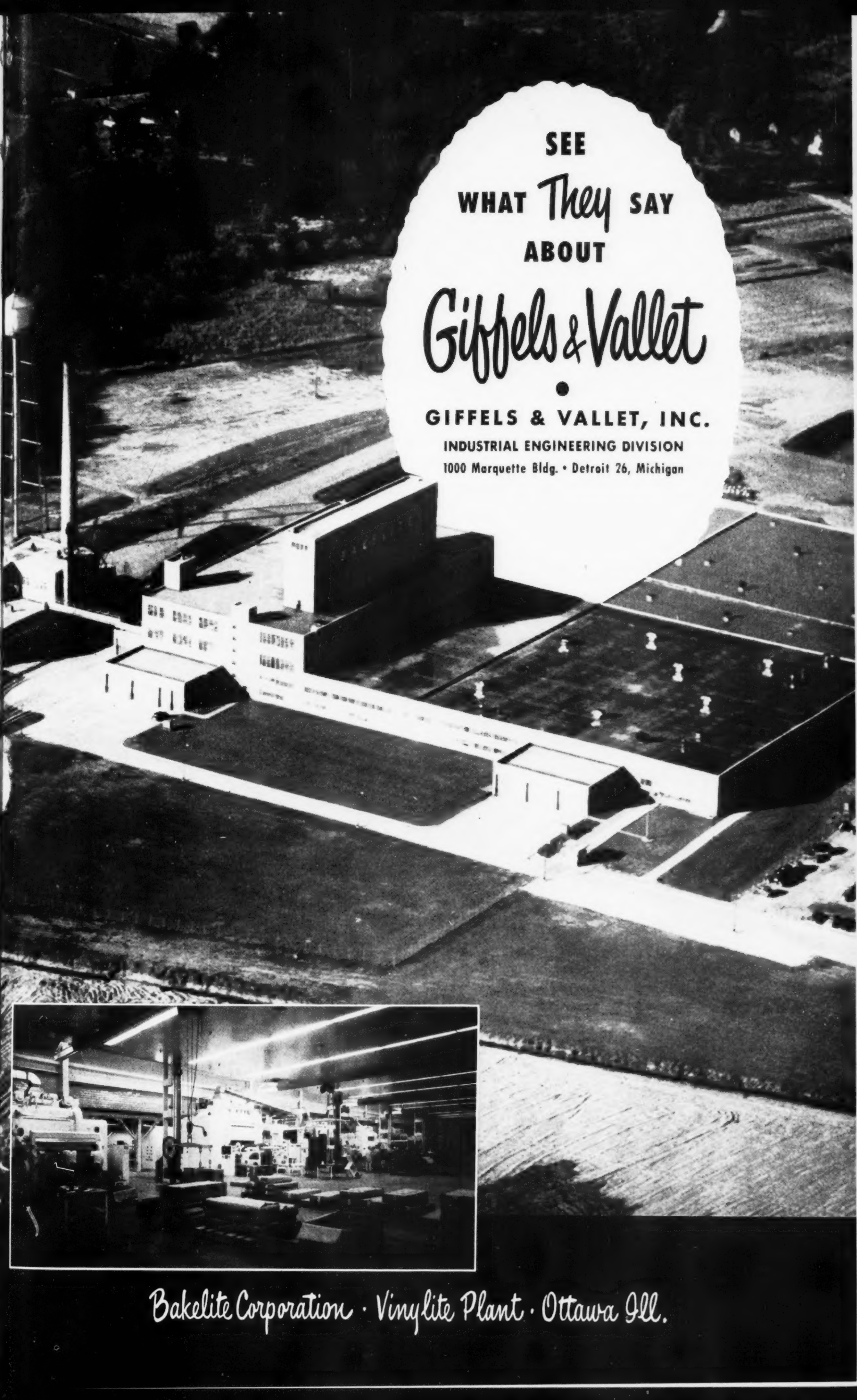
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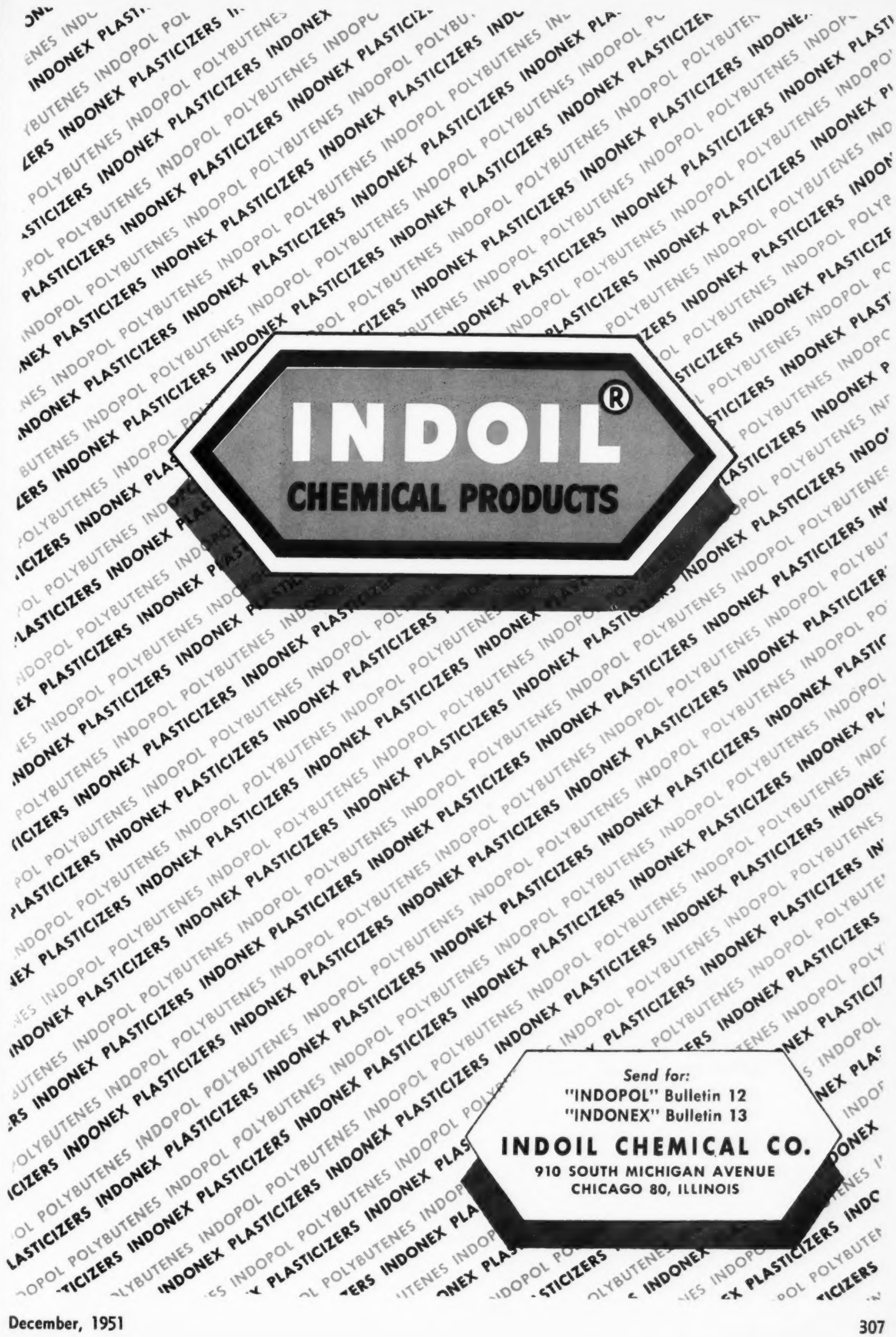
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VOL. 125—NO. 3 DECEMBER, 1951

An Improved Neoprene—Type WRT[1]

R. R. Radcliff[2]

NEOPRENE TYPE W, the first of a new class of chloroprene (2-chloro-1,3 butadiene) polymers was described in 1949 by Forman, Radcliff, and Mayo.[3,4] Although Type W exhibits many advantages over previous chloroprene polymers with respect to stability, processability, and compounding latitude, it is subject to crystallization in both unvulcanized and vulcanized states when exposed to moderately low temperatures.

The need of a crystallization-resistant type of chloroprene polymer has been partly filled by Neoprene Type RT, described by Mayo.[5,6] Although Type RT has been used for applications requiring resistance to crystallization, it is not so good as Type W with respect to stability in the crude form, in processability, and in certain vulcanizate properties. Accordingly, research was initiated on a Type W polymer which would have crystallization resistance. This research has resulted in the development of Type WRT.

Neoprene Type WRT is a modification of Type W, which closely resembles the latter in response to vulcanizing agents and accelerators and in vulcanizate properties and in addition resembles Type RT in resistance to crystallization both in uncured and cured states. These advantages have been attained without sacrificing any of the well-known properties of the general-purpose neoprenes; for example, resistance to oxidation, resistance to weathering, resistance to swelling in oil, and flame resistance.

Test Methods Used

Procedures described by the American Society for Testing Materials were used for testing the compounds reported herein. The properties in tension were determined according to Method D412-49T; resilience, according to D945-49T; hardness, according to D676-49T (Shore A durometer); and tear resistance, according to D624-48 (Die C). Compression set was determined according to D395-49T (Method B) with 72 hours' conditioning and 30 minutes' recovery. Brittle point was tested by Method D746-44T, using the solenoid actuated apparatus as devised by du Pont; heat aging followed Method D865-50T; plasticity, D926-47T; and scorch resistance, D1077-49T.

Crystallization was estimated from X-ray diffraction data obtained with the North American Phillips Geiger counter X-ray spectrometer Type 12021. Measurements were taken, using nickel filtered copper radiation, maximum amplification, and medium slits. Elongated specimens were prepared by stretching just before X-ray measurements were made.

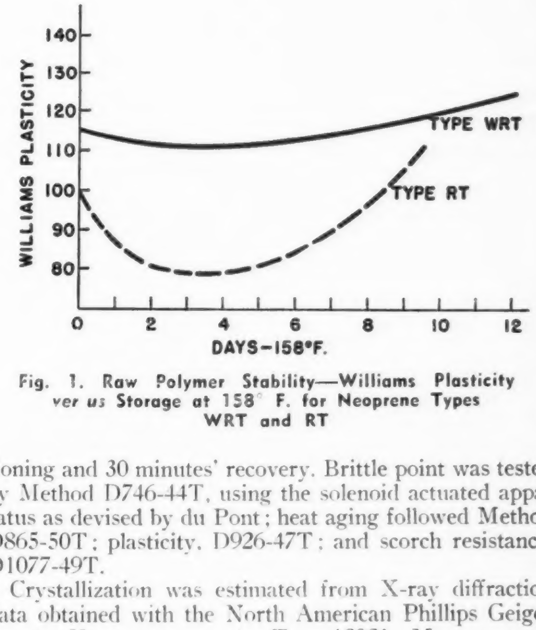

Fig. 1. Raw Polymer Stability—Williams Plasticity ver us Storage at 158° F. for Neoprene Types WRT and RT

Storage Stability of Polymer

It has been shown that plasticity changes during storage are a convenient criterion of polymer stability. Forman and coworkers[3] have shown that, using this method, Neoprene Type W is much more stable than Type GN. It is therefore interesting to compare the plasticity changes of Neoprene Types WRT and RT which occur during storage at 70° C. (158° F.). See Figure 1. The curve for Type RT is characteristic of this class of polymers; i.e., the plasticity numbers decrease during a short aging period, but increase with subsequent aging, and

---

1 This paper is contribution No. 88 from the rubber laboratory of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Its presentation, October 19, 1951, before the Boston Rubber Group was the first public announcement of the new Neoprene Type WRT.
2 Du Pont rubber laboratory.
3 Du Pont Rubber Chemicals Division Report 49-3 (1949).
4 *Ind. Eng. Chem.*, 42, 686 (1950).
5 Du Pont Rubber Chemicals Division Report 49-2 (1949).
6 *Ind. Eng. Chem.*, 42, 696 (1950).

Table 1. General Properties of Neoprene Type WRT-SRF Carbon Black Compounds

Compound	Min. Cure at 153° C. (307° F.)	A-1	B-1	C-1	D-1	E-1	F-1	G-1
Neoprene Type WRT		100	...	...	100	...	100	...
W		...	100	...	...	100	...	100
RT		...	...	100	...	...	...	...
Phenyl beta naphthylamine		1	1	1	1	1	1	1
Extra-light calcined magnesia		4	4	4	4	4	5	5
2-Mercapto imidazoline		...	...	...	0.5	0.5	...	...
DOGT salt of dicatechol borate		...	...	...	...	...	0.5	0.5
SRF carbon black		29	29	29	29	29	29	29
Zinc oxide		5	5	5	5	5	2	2
Mooney scorch at 121° C. (250° F.)—minutes to a 10-point rise above minimum		45 ±	45 ±	39	10	11	43	35
Stress at 300% elongation, psi	7½	175	200	1225	1650	1650	1125	1450
	15	275	275	1300	1825	1950	1400	1775
	30	650	850	1525	2150	2200	1725	1925
	60	775	1000	1700	2200	2200	1925	2000
Tensile strength, psi	7½	775	925	3050	3375	3750	3225	3600
	15	1250	1250	2950	3200	3650	3500	3650
	30	2475	3050	3100	3400	3550	3275	3500
	60	2900	3150	3125	3200	3300	3350	3600
Elongation at break, %	7½	1240	1140	840	540	600	700	610
	15	1040	940	720	460	480	600	540
	30	780	680	700	440	430	500	490
	60	700	640	620	400	400	480	480
Hardness, Shore A durometer	7½	43	43	60	58	59	52	54
	15	46	48	60	60	60	55	56
	30	49	55	61	60	60	56	56
	60	49	55	65	60	60	56	58
% Resilience at 24° C. (75° F.)—Yerzley	20	61.6	61.2	76.4	74.8	77.0	65.8	71.0
	40	62.5	63.6	77.1	76.2	77.7	68.6	71.0
Compression set—Method B—30% deflection—70 hrs. at 100° C. (212° F.)	20	99	99	90	36	29	52	28
	40	75	61	74	22	16	30	23
Tear resistance—pounds per inch	15	...	...	350	280	280	...	...
Brittle point-du Pont Solenoid—° C	15	...	...	—42	—40	—42	...	...
Properties after aging at 121° C. (250° F.) in air for 5 days—15' at 153° C. (307° F.) cure								
Tensile strength, psi	...	...	...	2450	2700	2850	...	...
Elongation, %	...	...	...	260	360	400	...	...
Hardness, Shore A	...	...	...	75	72	69	...	...

after about nine days' aging, the plasticity number has increased approximately 10 units above the original value. In contrast to this reaction, the curve representing the plasticity changes in Type WRT shows that this polymer has practically no decrease in plasticity number during the initial stages of aging, and only after about 12 days' aging does the plasticity number increase to 10 units above the original value.

A rigorous correlation between aging at 70° C. (158° F.) and "normal" storage temperatures which may range from 45 to 105° F. is obviously impossible. However, experience which has been gained by using neoprene polymers under field conditions seems to justify the estimate that raw polymers aged for one day at 70° C. (158° F.) have similar properties to polymers stored for three months under normal warehousing conditions.

Vulcanization

Since Neoprene Type WRT is basically similar to Type W, its vulcanization is best accomplished by using the same accelerators that have proved useful for Type W. The data presented in Table 1 shows comparisons of Types WRT and W compounds containing SRF carbon black and accelerated with magnesium and zinc oxides alone as well as with two preferred types of accelerators—(1) 2-mercapto imidazoline,[7] a rapid-curing accelerator which produces outstanding compression set and resilience properties, and (2) the DOTG salt of dicatechol borate, which is capable of producing compounds having high states of cure combined with good processing safety. For additional reference, Table 1 includes a comparable Type RT compound containing only magnesium and zinc oxides as curing agents.

The data in Table 1 show that Type WRT (F-1) has a slower rate of cure than Type W (G-1) in the presence of the DOTG salt of dicatechol borate. In the presence of 2-mercapto imidazoline (D1 and E1), however, there is no substantial difference. These data show also that metallic oxides alone are impractical for vulcanizing Neoprene Types WRT (A-1) and W (B-1); although they are generally preferred for Type RT (C-1).

Crystallization

One of the outstanding physical manifestations of elastomer crystallization is the increase in hardness of unvulcanized and vulcanized compounds during exposure to temperatures favoring crystallite formation. In unvulcanized compounds this development of stiffness is often associated with a loss of building tack and flexibility, which complicates processing. In vulcanized compounds the development of stiffness causes changes in the product which may render it temporarily unserviceable. Crystallization can be removed by moderate heating, since the phenomenon is reversible, but this is frequently inexpedient and undesirable.

Neoprene Type WRT represents a remarkable advance in chloroprene polymers having crystallization resistance in both uncured and cured states. Figure 2 shows a comparison of this polymer with Type W and Type RT. The basis of comparison is the increase in Shore A hardness during exposure at 24° C. (75° F.) of unvulcanized SRF carbon black compounds. During exposure the Type W compound shows the increases in hardness which are typical of crystallizable polymers

[7] Throughout this investigation technical products were used as follows: 2-mercapto-imidazoline—Accelerator NA-22; di-ortho-tolylguanidine salt of dicatechol borate—Permalux phenyl beta naphthylamine—Neozone D; and tetra methly thiuram disulfide—Thiuram M.

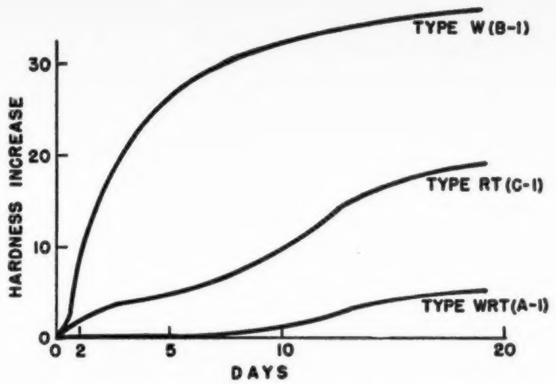

Fig. 2. Increase in Hardness at 75° F. of Uncured Stocks of Neoprene Types W, RT, and WRT. (Compound Identification from Table 1 Follows Type Identification)

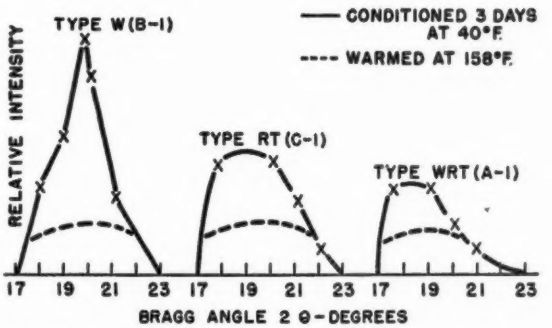

Fig. 3. X-Ray Diffraction Intensity of Uncured Stocks of Neoprene Types W, RT, and WRT—Bragg Angle 2θ in Degrees *versus* Relative Intensity. (Compound Identification from Table 1 Follows Type Identification)

held at temperatures favoring crystallization. A striking contrast to Type W is shown by Types WRT and RT. Both of these polymers are substantially inhibited in both the rate and the extent of their tendencies to harden. Of these two polymers, Type WRT is superior to RT.

Since the differences in hardness between the uncured Neoprene Types WRT and RT compounds and that of Type W were so significant, a comparison of these compounds by means of X-ray diffraction technique was undertaken in order to estimate the relative extent of crystallization in the compounds. Accordingly, uncured blocks of the compounds were conditioned for three days at approximately 5° C. (41° F.) in order to accelerate the development of crystallites. After this conditioning period, the blocks were subjected to X-ray examination. The data are shown in Figure 3 where the relative diffraction intensity is plotted against the Bragg angle 2 θ in the region of 17 (63° F.) to 24° C. (75° F.). Mayo[6] previously examined various neoprenes and reported a well-developed peak in diffraction intensity at the critical angle of approximately 19° 30′. The data in Figure 3 show that only the Type W compound has a well-defined peak in this region, indicating much crystallization.

The reversible nature of crystallization is illustrated by the dotted lines in Figure 3. These represent X-ray diffraction intensities obtained on the uncured compounds after they were warmed for 15 minutes at 70° C. (158° F.) to remove the crystallization which had developed during the three-day exposure at 5° C. (41° F.). The data show that under these conditions all three polymers are equivalent in their relative freedom from crystallization.

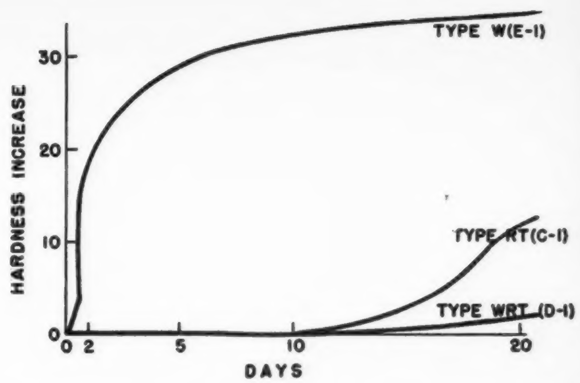

Fig. 4. Increase in Hardness at 32° F. of Neoprene Types W, RT, and WRT Vulcanizates Compounded with SRF Carbon Black. (Compound Identification from Table 1 Follows Type Identification)

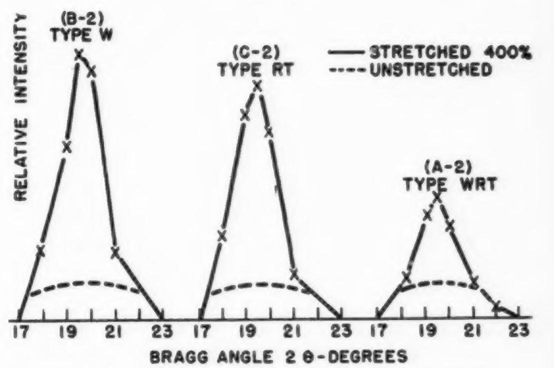

Fig. 5. X-Ray Diffraction Intensity of Neoprene Types W, RT, and WRT Gum Stocks Cured 20 Minutes at 307° F.—Stretched 400% and Unstretched. (Compound Identification from Table 2 Follows Type Identification)

The results of crystallization are also manifested as hardness in the vulcanizates. Figure 4 shows a comparison of the increase in hardness of SRF carbon black vulcanizates of Neoprene Types WRT, RT, and W during exposure at 0° C. (32° F.). The relative resistance to hardening of the three compounds is in the same order as observed with the uncured compounds shown in Figure 2, and the superiority of Type WRT is again evident.

Neoprene Types CG, GN, and RT vulcanizates in common with numerous other elastomers also undergo crystallization when they are stretched. Mayo[5] showed that under X-ray examination the crystallites which occur in neoprene during stretching appear to be identical to those which occur during static exposure at temperatures favoring crystallization. Since both the uncured and the cured Neoprene Type WRT compounds showed little tendency to crystallize, an X-ray diffraction investigation of a gum-type vulcanizate was undertaken both before and after stretching at 400% elongation in order to determine whether crystallization is also inhibited under these conditions.

Figure 5 shows the comparisons which were made with Types W and RT compounds, recipes for which are given in Table 2. The data show that the Type WRT compound has a peak in intensity at the same critical angle (approximately 19° 30′) as Types W and RT. This indicates that Neoprene Type WRT will crystallize during stretching, but the relative extent of crystallization is somewhat less than that shown for Types W or RT.

TABLE 2. GUM STOCK RECIPES—COMPOUNDS USED FOR X-RAY DIFFRACTION INVESTIGATION UNDER CONDITIONS: STRETCHED 400% AND UNSTRETCHED

Compound	A-2	B-2	C-2
Neoprene Type WRT	100.0	....	....
W	....	100.0	....
RT	....	....	100.0
Extra-light calcined magnesia	2.0	2.0	4.0
2-Mercapto imidazoline	0.25	0.25	....
Phenyl beta napthylamine	0.5	0.5	0.5
Zinc oxide	5.0	5.0	5.0

Compression Set

Many applications for elastomeric compounds require a high degree of resistance to permanent deformation under compressive stress. Neoprene Type W vulcanizates have been shown to be outstanding in this respect. It is increasingly desirable that low compression set be maintained over a very broad temperature range such as —40 to +150° C. (—40 to +302° F.) Neal[8] showed that Neoprene Type W vulcanizates are excellent over the temperature range of 70 to 121° C. (158 to 250° F.). It has long been recognized, however, that vulcanizates of crystallizable elastomers, such as natural rubber and Neoprene Type W, will assume high permanent deformation when compressed at temperatures most favorable for the development of crystallization [—20° C. (—4° F.) for natural rubber; 0° C. (32° F.) for neoprene].

Confirming this effect of crystallization, Mayo[5, 6] observed that Neoprene Type RT vulcanizates are better than Type GN vulcanizates with respect to resistance to compression set at —7° C. (+19° F.). Despite improvements in either the relatively low or the relatively high temperature range, no previous neoprene has had entirely adequate resistance to compression set at both low and high temperatures. Figure 6 shows a comparison of the compression set values of Neoprene Types WRT, W, and RT vulcanizates over a temperature range of —40 to +150° C. (—40 to +302° F.). The most striking differences observed in the range of —40 to +24° C. (—40 to +75° F.) are those existing between Types W and WRT. They demonstrate clearly the improvements in compression set resistance obtained with the latter polymer. The superiority of Type WRT over Type RT in this temperature range is also shown. Consideration of the range of 24 to 150° C. (75 to 302° F.) shows even greater differences between Types WRT or W and Type RT. The latter vulcanizate is nearly 100% deformed at conditioning temperatures of 100° C. (212° F.) and above; while those of Types WRT and W are less than 50% deformed after exposure even at the highest temperature. The data from which Figure 6 were obtained are tabulated in Table 3 along with the various compounds. Also included for reference is a natural rubber compound designed to have low compression set at elevated temperatures. The data show that natural rubber is similar to the other elastomers in showing a loss in resistance to permanent deformation when the compressive force is applied at either a high or a low temperature. As the temperature is increased above 24° C., there is a gradual loss in resistance to compression set. As the temperature is decreased, the value passes through a maximum at a temperature closely approximating the temperature of maximum tendency to crystallize. It is noteworthy, however, that under the most unfavorable conditions for the two elastomers (0 to —20° for Neoprene Type WRT; —20 to —40° for natural rubber) the compression set of the Neoprene Type WRT vulcanizate is only about half of that of the natural rubber vulcanizate. (33 and 56% for neoprene type WRT; 96% and 95 for natural rubber.) Under the other temperature conditions shown in Table 3, they are essentially equivalent.

[8] *Rubber Age* (N. Y.), Aug., 1950, p. 569

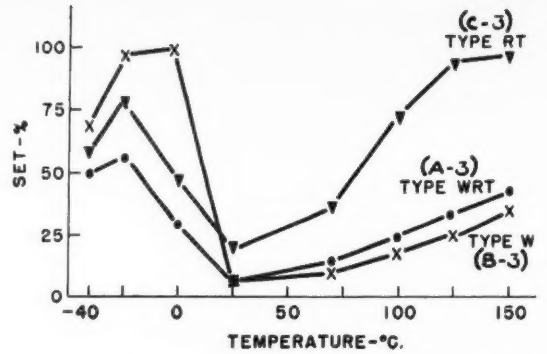

Fig. 6. % Compression Set of Neoprene Types W, RT, and WRT Vulcanizates between —40 and 150° C. (—40 to 302° F.) (Compound Identification from Table 3 Follows Type Identification)

TABLE 3. COMPRESSION SET PROPERTIES OF NEOPRENE AND RUBBER AT VARIOUS TEMPERATURES

Compound	A-3	B-3	C-3	D-3
Neoprene Type WRT	100	...	...	...
W	...	100	...	...
RT	...	...	100	...
Smoked sheets	...	...	...	100
Phenyl beta naphthylamine	1	1	1	1
SRF carbon black	29	29	29	29
2-Mercapto imidazoline	0.5	0.5	...	...
Extra-light calcined magnesia	4	4	4	...
Zinc oxide	5	5	5	5
Stearic acid	...	...	...	1
Tetramethyl thiuram disulfide	...	...	...	2
Sulfur	...	...	...	0.5

Cure: 40 minutes at 153° C. (307° F.)

Exposure Temperature		% Compression Set			
° C.	° F.				
—40	—40	50	65	58	95
—20	—4	56	98	77	96
0	32	33	98	48	12
24	75.2	6	6	16	6
70	158	11	8	37	12
100	212	22	16	74	20
121	249.8	31	22	87	28
150	302	45	33	94	44

Summary and Conclusions

Neoprene Type WRT is a new synthetic rubber which closely resembles Type W except that it has much greater resistance to crystallization both before and after vulcanization. It has a high degree of resistance to compression set over a temperature range as broad as —40 to 150° C.

Rubber for Windows

Rubber is used in a new type of double window designed to help keep out cold and generally to insure even temperature of interiors. According to *Rubber*,[1] organ of Rubber Stichting, Delft, Holland, this Belgian product, known as Thermoglass, consists of two (or more) panes of the same size set in a seamless rubber frame so constructed as to provide a uniform space between the hermetically sealed panes. The original air in the space between the panes, which might have been more or less moist, is replaced with dry air to avoid the risk of the formation of condensation water on cooling.

It is claimed that the use of panes of this type permits a saving on an average of 40% on the fuel usually required. In Belgium these windows have been installed in the hot-houses for tropical plants in the zoological gardens in Antwerp; they have also proved successful in that country as walls and ceilings of conservatories. On the other hand, Thermoglass helped to air-condition the saloon car of a foreign dignitary.

[1] 7, 4, 142 (1951)

New Uses for Glycerine In the Rubber Industry

Milton A. Lesser[1]

ALREADY well known for its many, varied uses in rubber compounding and treating, glycerine has continued to find new and important uses in the industry. Examination of the technical literature of only the last year or so clearly shows the growing utilization of glycerine's important physical properties. To give just one outstanding example is the employment of glycerine's familiar anti-freeze property in low-temperature emulsion polymerization processes. The chemical characteristics of glycerine (glycerol) are similarly finding greater utilization in the synthesis of alkyd resins and other derivatives of value to rubber technologists.

Glycerine has long enjoyed an outstanding position as a safe and efficient lubricant (1).[2] This lubricating characteristic continues to find extensive application in the formulation of lubricants for slab coating and mold release. In processes in which rubber molds are used for casting various objects, glycerine is employed as the lubricant to assure finer detail and to prevent sticking. Not only is glycerine being used in industrial molding processes, but also in the modified methods devised for the semi-commercial producer or home craftsman (2).

Beckwith and his associates (3) in their work used a tackmeter to measure the tack (as distinguished from tackiness) of butyl and natural rubber. Among other findings they observed paraffin wax decreased the tack to almost half its value; stearic acid less so; while glycerine, Forum-20, petrolatum, dibenzyl ether, aluminum stearate, and zinc stearate did not significantly affect this property.

Use in Synthetic Polymer Production

As with natural rubber, glycerine has found extensive use in the processing and treatment of synthetic polymers. Particularly important, however, are glycerine's potentialities as a freezing point depressant in emulsion polymerizations at low temperatures for the production of chemical rubbers with improved characteristics. Johnson, Brown, and Bebb (4) in their investigations of subzero polymerization adjusted the system by replacing part of the water by an anti-freeze agent which would not interfere with the reaction. Methanol, ethanol, and acetone inhibited polymerization in the alkaline reduction-oxidation (e.g., redox) system; while glycerine, was found to be satisfactory and was used throughout the investigation.

As a result of these studies, redox recipes have been developed for the copolymerization of butadiene and styrene at temperatures ranging from —40° to 40° C. (—40 to 104° F.), using glycerine as the anti-freeze in the subzero charges. It was found that the total amount of glycerine present, as well as the glycerine-water ratio, bears a critical relation to the speed of reaction. The ratio is limited, however, in the case of —40° C. polymerizations to the minimum freezing mixture of glycerine and water. With proper adjustment of the polymerization recipe, 60% conversion was observed at —25° C. (—13° F.) and —40° C. in 16 and 96 hours, respectively. In general, it is reported, a more processable polymer with more uniform breakdown characteristics was obtained at —25° C. and —40° C. than at 10° C. (50° F.)

More recently, in government-sponsored studies Marvel and Shields (5) set out to develop a reproducible method for the copolymerization of butadiene and styrene at —20° C. (—4° F.). They employed a recipe containing a high proportion of glycerine, one which had occasionally given soluble polymers of high intrinsic viscosity. It was found that reproducible results could be obtained with this formula when the entire charging technique is carried out in an inert atmosphere. With such a procedure the polymers were essentially gel-free, even though no modifier was used. No microgel was detected by centrifuging or by cold-milling.

Use with Rubber Products

New developments in the manufacture of rubber products may call upon other properties of glycerine. For example, it may be used in the production of sharp-freezing containers, such as ice trays which permit the easy removal of ice cubes. In this process (6) the surface of the dividing partitions, which may be of natural or synthetic rubber, is treated by immersion into a liquid mixture of 80% concentrated sulfuric acid and 20% glycerine. The resulting reaction imparts a velvety feel of the rubber and gives it a finish that offers little frictional resistance.

Rice (7), discussing the use of latex in rubber-base paints, states that a slow-drying latex film is obtained by the addition of glycerine, as a hygroscopic agent, to the latex in the amount required to give the desired degree of drying.

Alkyd Resin Use

Consideration of rubber-based paints naturally brings to mind the use of glycerine-formulated alkyd resins in conjunction with chlorinated rubber. An alkyd resin is produced by the reaction of a polyhydric alcohol with a polybasic acid. The resulting product is seldom used as such, but is modified with oils, fatty acids, and other agents to meet the requirements of the many uses to which these resins are put. Most important, of course, is the use of alkyds in the production of tough, durable, resistant, and beautiful decorative and protective coatings and finishes.

Although other polyhydric alcohols find employment in alkyd formulation, as noted by Moore (8), "glycerine usage is predominant." Earhart (9) has also described glycerine as the "workhorse" of today's alkyd resin in-

[1] Glycerine division, Association of American Soap & Glycerine Producers, New York, N. Y.

[2] Numbers in parentheses refer to Bibliography items at end of this article.

dustry—it is the polyhydric alcohol used in the largest amount. Actually, better than one-quarter of the glycerine produced in this country goes into alkyd resin production. The most important of these resins are those of the glyceryl-phthalate type.

Quite a large number of alkyd resins shows good miscibility with chlorinated rubber (10) and their advantages are described by Martin (11) in his report on the value of chlorinated rubber in the protective coatings field. He pointed out that because of its excellent alkali, acid, and chemical resistance, chlorinated rubber finds extensive use as a base for maintenance paints and concrete finishes. He also notes that chlorinated rubber, of a viscosity suitable for brushing and spraying, is too hard and insufficiently soluble to be used without modification as a paint vehicle and normally must be softened with a plasticizer to improve flexibility. Chlorinated rubber is usually compounded with a resin to heighten adhesion and toughness.' Alkyd resins are often used for this purpose.

According to Martin, the best adhesion, gloss, and toughness for a paint that is to be applied to metal, wood, or concrete are obtained with chlorinated rubber modified with an appreciable quantity of alkyd resin. Heiberger (12), in a study of modern trends in formulations for metal finishes, cited corrosion-resistant enamels made from combinations of chlorinated rubber and alkyds.

Just as alkyd resins can be used to improve the qualities of chlorinated rubber finishes, so chlorinated rubber may be employed to fortify alkyd-based enamels. In many formulations the presence of the rubber compound improves chemical resistance, tint, and gloss retention and exterior durability (10). When used in the fortification of an alkyd finish, the rubber compound materially increases drying speed, initial hardness, and chemical resistance of the coating (11).

As shown in a foreign report (13) recently made available in this country, glycerine itself may be used to improve the qualities of products made from rubber hydrochloride. An oilproof and age-resisting material is obtained by causing rubber hydrochloride to react with glycerine at 130° C. and polymerizing the product in the presence of a suitable catalyst.

Compounding and Processing

Ester gum and related compounds are also finding application in the rubber industry. Sometimes described as "the first of the modern synthetic resins," ester gum is made by reacting glycerine with rosin. The use of compounds of this class is illustrated in the process developed by Abernathy and Scott (14) for preparing stable polychloroprene latices containing a rosin ester in an alkaline resinate emulsion. If desired, part of the chloroprene may be replaced with styrene, acrylonitrite, butadiene, or the like. Suitable rosin esters include glyceryl abietate and the glycerine ester of hydrogenated rosin. The polychloroprene latices thus formed may be used in the coating and impregnation of paper, asbestos, etc., where the retention of flexibility in the uncured films is required. The material may also be employed as a blending agent for conventional polychloroprene latices, acting as a vulcanizable plasticizer.

Other glycerine derivatives are attracting the attention of rubber technologists. Marple (15) has found that various glycerine ethers form effective plasticizers or softeners for certain synthetic rubbers. As an example, when one part of triallyl ether of diglycerine was used as a softener for 100 parts of Hycar OR, it gave elongations equal to those obtained through the use of 25 parts of dibutyl phthalate per 100 parts of Hycar OR. Other diglycerine ethers tested by Marple were the tetraallyl, triisopropyl and tris (methylisobutylcarbinyl). The diisopropyl and bis (methylisobutylcarbinyl) glycerine ethers were also tested.

Of related interest is the suggestion (16) that glyceryl dioleate can be used as an efficient plasticizer for synthetic resins and rubbers. This polyester was prepared by heating oleic acid, glycerine, and phosphoric acid under reduced pressure. Also indicative of the potentialities of glycerine derivatives is the use (17) of one such compound in the preparation of rubber-like materials. Glycerine-*alpha, gamma*-dichlorohydrin was the derivative employed for this purpose.

Summary and Conclusions

As lubricant, paint component, and vital raw material in the manufacture of alkyd resins and emulsifiers, glycerine, as it does in so many other industries, continues to play an important part in the processing and care of rubber products.

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Ladies Billfolds of Embossed Vinyl Plastic with Polka Dot Interior Trim

Embossed Vinyl Plastic Billfolds

NEW satin textured ladies' billfolds, made of durable, embossed Vinylite plastic film in polka dot patterns styled by Lilly Dache, are being produced by Aristocrat Leather Products, Inc., New York, N. Y. Luxurious to the touch and appealing to the eye, these billfolds provide all the economical and long-wearing qualities of Vinylite film, including resistance to finger smudges and stains, oils, alcohol, scuffing, and abrasion from frequent handling. All seams are heat-sealed to resist ripping or tearing, and the billfold contains a removable pass case with four windows, a secret pocket for bills, an expanding button-down coin purse, and a button tab closure. Styled with a polka-dot trim on the inside in contrasting tones, the billfolds come in colors to match the latest fashion shades, including navy with gray trim, and red, green, and brown colors with lighter hue trims.

The Zinc Oxide Stability of Latex[1]

G. E. van Gils[2]

Fig. 1. Apparatus for the Determination of the ZnO Stability

IN THE Indonesisch Instituut voor Rubberonderzoek laboratories we are concerned with problems regarding the production of concentrated natural rubber latex as well as with problems regarding the application and uses of such latex. Experience gathered during many years has shown that nothing is more variable and tricky than a substance like latex. It is very difficult to explain the meaning of this "variability" apart from the chemical composition since it involves factors which are known, but are difficult to describe. Even if we restrict ourselves to the important property of the *stability* of the latex, it is not easy to give a clear and sharp definition.

The *mechanical stability* of latex covers only one aspect of stability. Sometimes the term *chemical stability* is used, but without further mention of the type of chemical agent used to measure the stability.

In this paper we will deal only with *zinc oxide stability* since this type of stability is of special importance in latex technology. We will first concern ourselves with the way in which this zinc oxide stability is affected by the composition and condition of the latex and then deal with the effect on zinc oxide stability obtained by adding certain chemicals to the latex.

The Determination of Zinc Oxide Stability

When zinc oxide is added to latex containing ammonia, the viscosity of the latex usually increases owing to the solubilization of the zinc oxide and the resultant formation of positively charged complex ions which decrease the colloidal stability of the latex. This thickening process is accelerated by increasing the temperature and sometimes may result in total coagulation of the latex.

To determine the zinc oxide stability of a latex, either the increase in viscosity under predetermined conditions or the time to coagulation may be measured. In most of the experiments described in this paper the time to coagulation method similar to that already described by Le Petit[3] was used.

In making the determination of zinc oxide stability, 10 cubic centimeters of latex containing zinc oxide, which has been added in the form of a water dispersion, is placed into a small glass cylinder of 25-cubic centimeter capacity. This glass cylinder is covered at the top with a metal cap, through the middle of which a tiny stamplet for stirring the latex is inserted (see Figure 1). The whole apparatus is immersed into a water bath maintained at a temperature of 80° C. As the latex thickens, it is tested by moving the stirrer up and down at regular intervals. When the entire latex mass can be lifted in the form of a lump of coagulum, the end point has been reached, and the zinc oxide stability in minutes or seconds recorded.

In an early experiment the effect of adding increasing amounts of zinc oxide to latex was investigated, and it was found that with more than 2.4 grams of zinc oxide per 100 grams (dry weight) of latex, the coagulation or gelation times were constant, but were at varying levels, depending on the amount of ammonium nitrate used to increase further the gelation rate (see Figure 2). Gelation with the sole addition of zinc oxide occurs only with old preserved latex. With fresh latex the addition of a small quantity of ammonium nitrate is necessary.

Also, in order to compare different samples of fresh latex, a certain amount of ammonium nitrate must be added in order to obtain a measurable coagulation time. The relation between coagulation time and increasing amounts of ammonium nitrate with a constant zinc oxide content is shown in Figure 3.

In connection with the data reported in Figure 3, however, if the time of coagulation is less than three minutes, the effect of variation in the amounts of ammonium nitrate used will be obscured since three minutes are required to bring the latex in the test cylinder up to 80° C.

Factors That Determine Zinc Oxide Stability

The work of Le Petit has provided latex technologists with a better insight into the mechanism of zinc oxide gelation. It was shown that the zinc oxide stability of a given latex is affected by so-called "minus" factors, i.e., substances which promote the solubilization of zinc oxide such as ammonium salts, amino acids, and the hydrolysis products from latex albumen, all of which reduce the stability of the latex containing zinc oxide. Also, our experiments with yellow and white fractions of latex have indicated that if the yellow fraction is removed from a given latex, the remaining white fraction is less stable to zinc oxide than is the total latex.

There are also "plus" factors in the form of certain substances that may be added to latex containing zinc oxide and stabilize it against the activity of the soluble zinc complexes or reduce the activity of these complexes.

In the work reported below we will present first the results of investigations concerned with certain characteristics of latex, as such, and their relation to zinc oxide stability. The effect upon zinc oxide stability of the addition of certain substances to latex will then be shown in a later section.

Latex Properties and Zinc Oxide Stability

ZINC OXIDE STABILITY *vs.* KOH NUMBER. The determination of the KOH number (Method D1076-49T of the American Society for Testing Materials) has come into quite general use in latex technology. In this method latex is titrated electrometrically with potassium hydroxide solution until at a pH between 10 and 11, an inflection point in the curve, pH *versus* KOH, occurs which is used to determine the KOH number. The method is essentially a means for the titration of the weak anions in the latex and, if other factors are con-

[1] Presented before the Division of Rubber Chemistry, A. C. S., Cleveland, O., Oct. 11, 1950. This paper is communication No. 78 of the Indonesian Institute for Rubber Research.

[2] Stichting Indonesisch Instituut voor Rubberonderzoek, Bogor, Indonesia.

[3] *Rev. gén. caoutchouc*, 240, 390 (1947); 25, 3 (1948); 26, 167 (1949); *Trans. Inst. Rubber Ind.*, 23, 104 (1947).

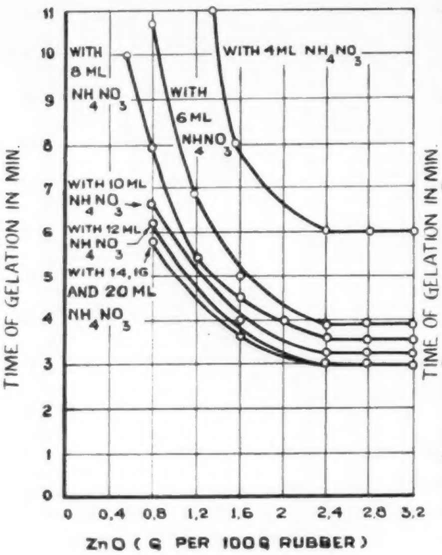


Fig. 2. Time of Gelation with Increasing Amounts of ZnO

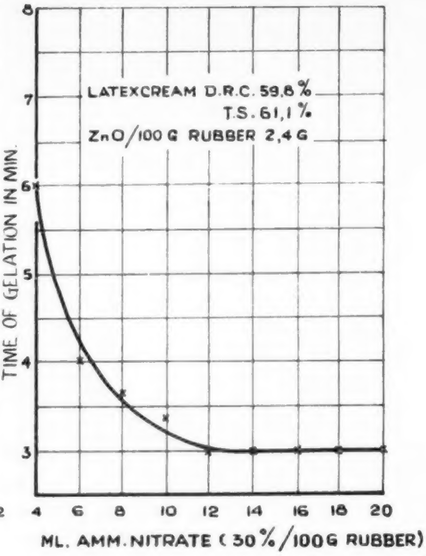


Fig. 3. Time of Gelation with Increasing Amounts of Ammonium Nitrate

stant, will result in an inverse relationship between zinc oxide stability and KOH number.[4]

H. C. Baker[5] drew a distinction between ether-soluble acids in latex, the amount of which is fairly constant for a given type of latex, and the water-soluble acids, which vary enormously in amount and which have very great effect on zinc oxide stability. Experiments carried out at the Rubber Research Institute of Malaya,[6] and confirmed by us, show that if the ammoniation of latex after tapping is delayed, or if the ammonia concentration is not brought up to the proper level, the KOH number increases while at the same time the zinc oxide stability decreases. In general, there is a similar increase in KOH number during the storage of preserved latex which is also accompanied by a decrease in zinc oxide stability. This phenomenon has also been investigated by Le Petit and coworkers.[5]

Although it is now generally accepted by latex technologists that a high KOH number is accompanied by low zinc oxide stability, it is our opinion that this fact may be true only when one sample of latex is considered. If several samples are taken at random from several latices for comparison, no correlation between KOH number and zinc oxide stability can be found.

TABLE 1. KOH NUMBER AND STABILITIES OF LATICES FROM DIFFERENT ORIGIN. TESTS RUN IN JUNE, 1950

Sample No.	Date of Preparation	Mech. Stab.,* Min.	KOH No.†	ZnO Stab., Min.
2	3/17/49	5½	478	8
5	6/ 5/49	9½	520	29
9	7/20/49	7¾	492	14
11	8/10/49	11½	489	8½
13	7/ 9/49	4	535	12½
14	9/23/49	9½	495	32
15	10/12/49	15	481	9
16	10/25/49	9½	512	7¼
17	11/ 9/49	7	410	37½
20	12/23/49	3½	421	12½
21	1/23/50	8	347	41¼

*Mechanical stability determined with Hamilton-Beach high-speed stirrer. Latex temperature not controlled, but room temperature fairly constant at 29° C. End point taken as first evidence of coagulation.

†KOH number in mgs. KOH per 100 gms. of latex (dry weight).

In Table 1, above, we have summarized data on KOH number and mechanical and zinc oxide stability on centrifuged ammoniated latices taken from different trees in the experimental garden of Tjiomas of the Centrale Proefstations Vereniging at Bogor, Indonesia. Dry rubber content of the samples was about 60%. No correlation was found between stability and KOH number.

EFFECT OF DRC ON ZNO STABILITY. The zinc oxide stability of latex is affected in the same manner as is the mechanical stability, colloid stability, etc., by the dry rubber content of latex being tested, i.e., the higher the DRC, the lower the zinc oxide stability. This effect is shown in Figure 4, where the zinc oxide stability of mixtures of centrifuged latex having a DRC of 56.6% and the corresponding skim with a DRC of 7.82% over a range of 15 to 50% were determined.

EFFECT OF YELLOW FRACTION. Mrs. L. N. S. de Haan (formerly Miss Homans) and G. E. van Gils have described the separation of fresh *Hevea* latex into a yellow and a white fraction.[7] The properties of these two fractions of latex appear to be quite different, and it was to be expected that their behavior toward zinc oxide would also be different. The white fraction is obtained by centrifuging fresh latex having a pH of 7 in a separator.

A few years ago we observed that the white fraction latex was very suitable for making molded articles by the Kaysam process since the amount of ammonium salts necessary to obtain a strong coagulum was very much reduced.

It now appears that the addition of yellow fraction latex to a sample of whole latex will increase the zinc oxide stability of the mixture. In investigating this characteristic of the latex yellow fraction, mixtures of latices *A*, *B*, and *C* were prepared in such a way that the DRC was always the same, but the ratio of white to yellow fraction was different and the percentage of yellow fraction varied from 0 to 50.

Latex A. A white fraction concentrate made by centrifuging fresh latex in a separator. DRC was 57.5%; TS, 59.1%.

Latex B. A yellow fraction latex made by centrifuging fresh latex in tubes. DRC was 21.1%; TS, 24.2%.

Latex C. White fraction latex made by diluting *A* with water to the same concentration as *B*.

[4] W. G. Wren, *Trans. Inst. Rubber Ind.*, 18, 91 (1942).
[5] *Ibid.*, 16, 165 (1940); 18, 115 (1942).
[6] Private communication.
[7] "Proceedings of the Second Rubber Technology Conference—1948," p. 292. W. Heffer & Sons, Ltd., Cambridge, England.

The increase in zinc oxide stability with increasing amounts of yellow fraction latex is shown in Figure 5. Apparently the yellow fraction contains substances which act as stabilizers against zinc oxide.

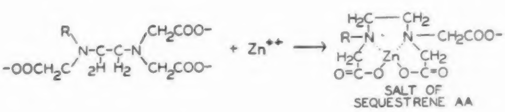
EFFECT ON ZnO STABILITY OF DEGRADATION OF LATEX PROTEINS. This phenomenon has been discussed and investigated very thoroughly by Le Petit. The findings of this worker parallel those of the INIRO laboratories, where before the late war we had determined that old latex was much more susceptible to thickening and coagulation with zinc oxide than was fresh latex.

Effect of Adding Substances to Latex

SURFACE ACTIVE AGENTS. In investigating the effect of added substances on the zinc oxide stability of latex, we first examined a series of surface active substances and found that neither fatty acid soaps nor sulfonated oil soaps[8] made any change in the zinc oxide stability of a given sample of latex. Neither was any change evidenced when protein containing materials such as casein, gelatin, globulins, or peptones of albumen was used.

Non-ionic emulsifiers of two different types investigated were Emulphor O and Vulcastab L. W.[9] Emulphor O appears to increase stability against zinc oxide; while Vulcastab L. W. is only slightly active, as may be seen from the results plotted in Figure 6.

SEQUESTERING AGENTS. Sequestering or chelating agents might be expected to improve the stability of latex against zinc oxide owing to the ability of such materials to neutralize the destabilizing zinc oxide complex. The action of Sequestrene AA[10] may be represented by the following equation:



A 5% solution of Sequestrene AA in dilute ammonia was prepared, but when it was added to the latex alone, flocculation occurred; only when the Sequestrene AA was mixed with Vulcastab L. W., was stabilization against zinc oxide obtained. A mixture of three parts of

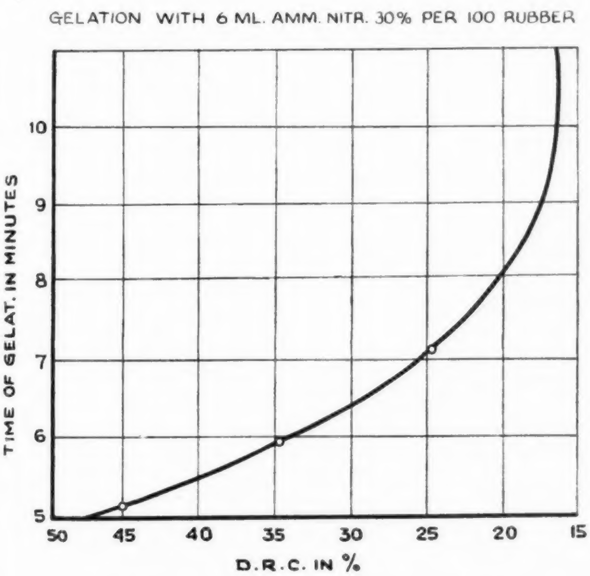


Fig. 4. Time of Gelation as a Function of DRC

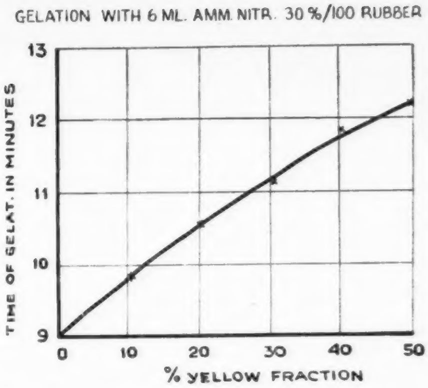


Fig. 5. Time of Gelation with Increasing Amounts of Yellow Fraction

Vulcastab L. W. (10% solution) with one part of Sequestrene AA (1% solution) was found to give the best results.

Table 2 gives some results of the effect of adding increasing amounts of the above mixture to latex and measuring the zinc oxide stability.

TABLE 2. EFFECT OF SEQUESTRENE AA—VULCASTAB L. W. MIXTURE ON ZnO STABILITY

Parts Mixture	ZnO Stability, Min.
0	5½
2	6½
4	7½
6	9
8	11
10	20

PHOSPHATES. The action of phosphates can best be demonstrated by their influence on the so-called "zinc oxide thickening," a phenomenon well known to latex technologists. In the results reported in Table 3, the effect of sodium pyrophosphate ($Na_4P_2O_7$) sodium tetraphosphate ($Na_6P_4O_{13}$—Quadrafos[11]), and trisodium phosphate ($Na_3Po_4 \cdot 12H_2O$) were investigated with regard to viscosity increase on standing in the following latex compound: Latex rubber (dry weight), 100; zinc oxide, 1.5; sulfur, 2.0; sodium dithiocarbamate, 1.0; borax casein, 10%, 2 c.c.; and water, 4 c.c. Subsequent to the addition of the stabilizer, water was added to keep the DRC of the compound at a constant level. Emulphor O was also included in this investigation.

The viscosity changes for the first ten days reported in Table 3 are plotted in Figure 7 in comparison with the control sample. It is evident that most of these phosphates as well as the Emulphor O are able to reduce zinc oxide thickening. For practical use we recommend 0.5-gram of trisodium phosphate per 100 grams of compounded latex (wet weight).

In the Kaysam process, phosphates may be used as a modifier to reduce coagulation time. The effect on gelation time of sodium pyrophosphate and sodium tetraphosphate, as well as the effect of sodium hydroxide, all in the form of 10% solutions, are shown in Figure 8.

Another material that may be of importance in controlling the zinc oxide stability of latex is sodium silicate; its activity is about the same as that of trisodium phosphate.

We also investigated a substance normally present in

[8] The ammonium salts of fatty and sulfonated oil acids will be considered separately.
[9] Imperial Chemical Industries, Ltd., London, England.
[10] Alrose Chemical Co., Providence, R. I.
[11] Rumford Chemical Works, Rumford, R. I.

Table 3. Effect of Various Sodium Phosphates on Zinc Oxide Thickening of Latex DRC, 56.6%; T. S., 58.1%

Run No.	Stabilizer	Per 100 C.C. Latex		Viscosity in Centipoises, after					
		C.C. Stab.	C.C. H_2O	1 Day	3 Days	7 Days	10 Days	14 Days	1 Mo.
1	Quadrafos, 10%	5	10	41.2	67.5	112.1	192.8	274.9	755.0
2		10	5	27.5	31.9	39.1	58.4	67.1	104.2
3		15	0	20.6	19.9	26.3	32.4	32.9	67.1
4	Emulphor O, 5%	3	12	51.7	89.6	110.5	142.2	143.1	211.2
5		5	10	44.9	66.8	82.9	124.4	135.3	188.6
6		10	5	29.1	34.9	37.6	41.8	43.0	53.8
7	Sodium pyrophosphate, (neutral), 10%	5	10	38.3	72.3	118.9	312.2	419.9	*
8		10	5	25.4	40.8	68.1	139.4	202.8	*
9		15	0	18.4	21.6	32.9	57.2	89.0	133.2
10	Trisodium phosphate, 10%	5	10	35.0	34.7	48.0	60.1	67.6	77.7
11		10	5	23.5	22.5	21.8	23.6	25.9	36.1
12		15	0	18.3	17.5	16.8	17.3	18.4	18.8
13	Control, orig. visc., 76.9	0	15	80.4	156.1	311.1	763.5	173.2	*

*Viscosity too great to measure.

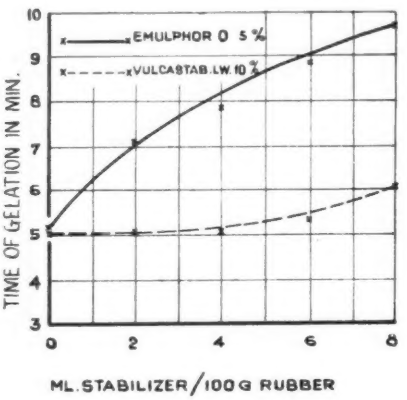


Fig. 6. Influence of Stabilizers on the Time of Gelation

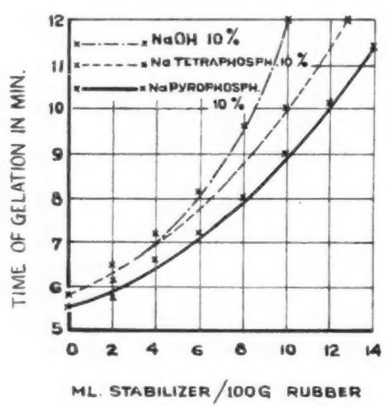


Fig. 8. Influence of Phosphates and NaOH on the Time of Gelation

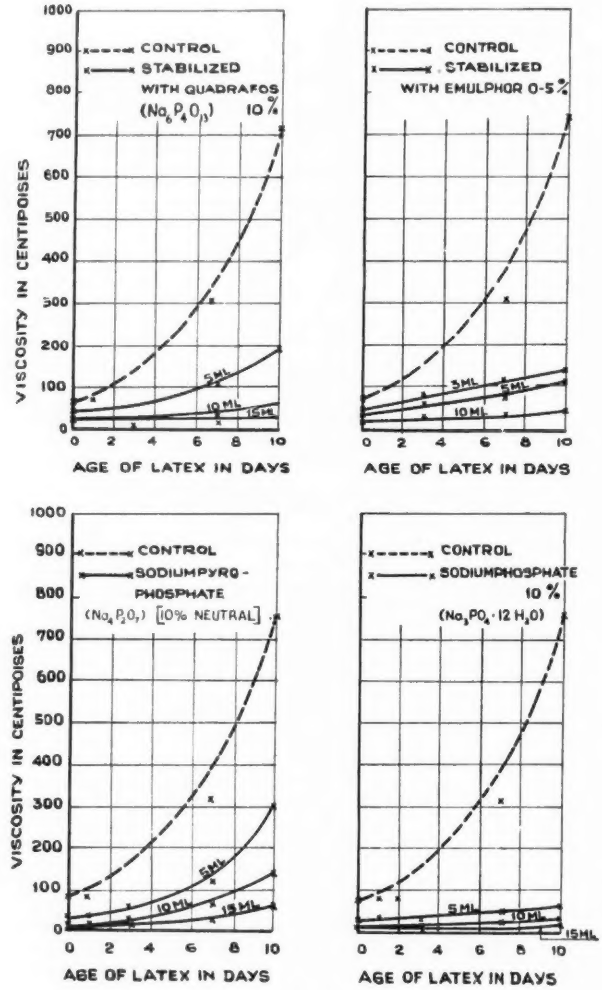


Fig. 7. Influence of Phosphates on Latex Thickening

fresh latex: namely, quebrachitol. The addition of 1.5 grams of quebrachitol to 100 cubic centimeters of concentrated latex reduced gelation time by one-half.

Ammonium Salts, Amines, Etc. Substances added to latex containing zinc oxide that reduce stability include ammonium salts, such as ammonium nitrate, which are very well known for their use in the Kaysam process. (See Figure 3.)

The degradation products of the proteins must also be mentioned, amino acids, etc., but this subject has already been studied extensively by Le Petit.[3]

We do not wish to become involved in a discussion of the mechanism of zinc oxide stability at this point, but will instead point out some of the practical applications of the use of ammonium salts and amines in latex processing and handling.

The Kaysam process has as its greatest disadvantage the fact that the coagulated rubber articles must be washed extensively before drying can take place. This procedure is not necessary with all ammonium salts, however, since it was found that ammonium stearate will produce coagulation in 15 minutes on heating when used in a concentration of 0.5-gram per 100 grams of latex rubber (Bins' method), and the resulting coagulum need not be washed although the coagulum is somewhat

sott. Ammonium oleate was found to be even better than ammonium stearate for such use.

According to Paul Gassagne,[12] unsaturated fatty acids are more likely to form zinc-ammonium complexes than are saturated fatty acids. A disadvantage of these ammonium fatty acid soaps, however, is their excessive foam formation which limits their application to the latex foam industry.

The following amines have been found to be active in stabilizing latex against zinc oxide: urea hydrochloride, mono- and diethyl amine hydrochloride. Triethylamine hydrochloride was not active; neither was triethanolamine.

In the course of this work on ammonium salts and amines it was found that ammonium naphthenate, and, in general, the soluble alkali salts of naphthenic acids will produce heat-sensitive latex without the disadvantages of other materials used for this purpose. Gelling time can be effectively regulated by the amount of naphthenate added to the latex, and the mechanical stability and the foaming capacity are increased at the same time. Patents for the use of these naphthenates in latex have been applied for.

Summary and Conclusions

A review of the factors which determine the zinc oxide stability of latex has been given. The work of Le Petit and our own experiments lead to the conclusion that the zinc oxide stability of latex is determined in the first place by substances which promote the solubilization of zinc oxide (minus factors); in the second place by substances which stabilize the colloid against the activity of the complex zinc cations or reduce the activity of these ions (plus factors).

It has been generally accepted that the higher the KOH number of a latex, the lower will be the zinc oxide stability. Since the KOH number is based primarily on neutralization of the acidic constituents of the serum only, a general correlation with zinc oxide stability could not be found when latices of different origin were examined.

Intrinsic factors or factors depending on the properties of the latex itself that influence zinc oxide stability are: (1) the dry rubber content of the latex, where high values are accompanied by low zinc oxide stability values and *vice versa*; (2) the yellow content fraction of latex which in increasing amounts adds to the stability of the latex; (3) the protein content of the latex which, when degraded either artificially or naturally reduces the zinc oxide stability.

The effect of materials added to latex on zinc oxide stability includes: (1) fatty acid and sulfonic acid soaps which have only slight influence; (2) Emulphor O, sequestering agents and sodium phosphates and silicates which have a stabilizing effect; (3) ammonium salts and amines have a marked destabilizing effect, although triethanolamine hydrochloride is not active. Quebrachitol has a slight destabilizing effect.

[12] Private report of Institut Français du Caoutchouc, Paris, France.

Report on the Malayan Rubber Industry

Need of Replanting Old Rubber

The importance of replanting old rubber has been very much in the foreground in discussions lately. Large estates have for some years now been providing for a regular replanting program of replanting exhausted and low-yielding areas with new high grade material, but smallholders on the whole have not been in a position to do much for themselves in this direction. Yet the need is great. The total area of smallholdings under 100 acres is, according to government figures, 1,400,000 acres, or 42% of the total acreage under rubber in Malaya, and over 90% of the trees are more than 25 years old and are either uneconomic or will become so before long.

The need of assisting smallholders to replant, both in their own interest and in that of Malaya as a competitor in the world market, has for some time been occupying the authorities. Before the war a scheme had been started to supply smallholders with material from budwood nurseries established on a number of Agricultural Stations throughout the country. In the latter half of 1949 the scheme was resumed, but on a much more ambitious scale; the aim is to replant 50,000 acres of smallholdings annually for five years, ultimately to be extended to 10 years if desirable. A grant of £121,786 under the Colonial Development & Welfare Fund permitted the scheme to get under way, with the Department of Agriculture and the Rubber Research Institute, Malaya, cooperating. The plan works under four sections—budwood multiplication nurseries, clonal seedling nurseries, provision of technical assistance, and provision for future supplies of planting material. To provide the necessary technical assistance, the R.R.I. gives six-month courses to selected youths from smallholding rubber areas, training them in all phases of rubber cultivation and processing.

A recently released government report on the progress to the end of 1950 proved disappointing, since up to that time only enough material had been applied for to replant or new plant 7,000 acres, about 14% of the annual goal of 50,000 acres.

The material is supplied to smallholders at a subsidized cost, but it is apparent that with prevailing high prices, smallholders have been loath to cut down old trees which still yield even a little rubber and wait six years for a new high-grade stand to reach the tapping stage—with the lack of progress noted.

The State of Perak has come out with a plan of its own involving not only the provision of good material and technical aid and supervision, but also financial assistance and grants of new land for planting the improved material. Perak has about 300,000 acres broken up into small rubber holdings averaging 2½-4 acres each, with trees all of which are stated to be 35 years old and over. A survey has reportedly shown that within five or six years these trees will be useless as rubber producers, and it is felt that the only way to get the desired replanting done is to help smallholders maintain themselves until their new stands reach the tapping stage.

Local Rubber Notes

Prang Besar Rubber Estates has acquired all the shares of the Bukit Prang Estate, which owned 1,095 acres of land adjoining the Prang Besar Estate.

The Rubber Shipping & Packing Control Ordinance is preparing to operate, insuring that rubber for export meets certain fixed standards. A Malayan Rubber Export Board is to be established; all packers and shippers of rubber will have to register and must be licensed; an appeal tribunal is to be set up and inspection is to be provided for.

Through its official organ, *The Planter*, The Incorporated Society of Planters warned government that frustration might soon set in among planters if the government continued to confuse itself and the public with schemes and plans which require a great deal of time and work and divert effort from the main object, which should be to end the emergency. Under present circumstances young planters, who will have to replace the 400 senior planters who will have left Malaya by 1956, get very little opportunity to learn their profession. Moreover, a large percentage of them will no doubt leave Malaya within the next few years, owing to conditions here, so that the industry and through it Malaya face a grave situation.

(*Continued on page* 366)

Editorials

Rubber Industry Lagging in Research Activity?

THE matter of the growing shortage of technical manpower in the United States, which may become increasingly noticeable during the next five or ten years, was discussed in this column in October. It was mentioned that the deficiency in engineers and in science graduates from our colleges and universities may be about 30,000 yearly in each case during that period.

If a recent analysis of surveys on research staffs in manufacturing industries, carried out by the National Research Council from 1920 to 1950, is borne out, the rubber industry should be particularly concerned since this shortage of technical manpower may come at a time when its need of such manpower may be much greater than usual.

Data on research staffs collected by the National Research Council have been used to point up certain trends and the relative magnitude of research in several industries, including rubber, by George Perazich, in the October 27 issue of *Chemical Week*. According to this analysis, the rubber industry has lagged behind the chemical and allied industries and the petroleum and coal products industries in the growth of its research staff. In estimated research expenditures per dollar value of output, the rubber industry has also lagged considerably behind the chemical and allied industries and, in fact, has declined steadily since 1937. The petroleum industry, which has had a rate of increase of expenditures paralleling that of the chemical industry since 1937, has now caught up with the rubber industry.

According to the National Research Council data analyzed in the above-mentioned article, the proportion of laboratory workers increased only from 173 to 187 for each 10,000 production workers in the rubber industry during the period 1937 to 1950. In the chemical industry the increase was from 137 to 303, and for the petroleum industry the increase was from 200 to 900 for the same period and on the same basis.

With regard to the matter of research expenditures per dollar value of output, precise figures were not available, but assuming the annual cost per laboratory worker at $7,000 a year, it was estimated that the chemical industry spent 1¢ in 1937 and 1.5¢ in 1950 per dollar value of output. The rubber industry spent 1.02¢ in 1937, but only 0.6¢ in 1950. The petroleum industry, which spent only 0.5¢ in 1937, spent more than 0.6¢ in 1950.

"If these figures are even approximately accurate, it would appear that in the rubber industry the limit of profits from investments in research was reached in the 30's, and that by 1950 it was no longer feasible to continue at this level. It is possible, too, that rubber industry management has not been so research-minded as its counterparts in the chemical and petroleum industries," Mr. Perazich states in the *Chemical Week* article.

Although the conclusions reached with respect to the research activities of the rubber industry may be considered an oversimplification, and certain major factors having bearing on the growth of research in the rubber industry may have been overlooked or not known to the writer of this article, the figures should be given serious consideration by rubber industry management. We believe that the rubber industry is as research-minded as the chemical and petroleum industries. The reasons for the low rate of growth of the research staff of the rubber industry during the 1937-1950 period may be that research activities in chemicals and plastics of many rubber companies have not been considered as rubber industry research activities and that, since much of the research on synthetic rubber has been done by the government during the past ten years, these activities would also not be credited to the rubber industry, as such.

Also, since the end of the late war there has been such a tremendous demand for the rubber industry's principal product: namely, tires, and the consumers have been sufficiently satisfied with the existing product, that the need of research and development aimed at producing an improved product have not been particularly urgent. Growth in the majority of manufacturing industries, however, has been demonstrated to be dependent on research and development leading to new or improved products, and the tire as well as other branches of the rubber industry cannot lose sight of the fact that even better products will be demanded in future years.

If and when the rubber industry owns and operates the majority of the synthetic rubber producing plants, research in this field will have to be done by industry workers and financed by industry funds. Provisions for this eventuality should be made now for a situation that may develop in one or two more years.

We are not at all sure that the situation on research in the rubber industry is as bad as it has been painted, but unless our reasons or other unknown reasons equally justifiable are the basis for this seeming lag in research activity, a larger staff and a bigger budget would seem to be vital to assure a continuance of the industry's growth rate at levels comparable to those for the chemical and petroleum industries.

Holiday Greetings

R. G. Seaman

Recent Developments in the Use of Fibrous Glass for Plastic Reinforcement[1]

C. E. Bacon and R. H. Sonneborn[2]

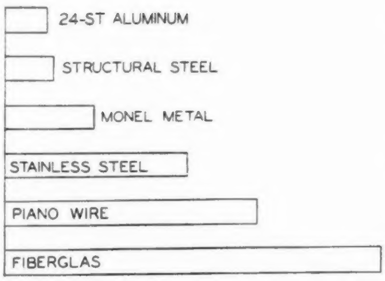


Fig. 1. Comparative Ultimate Tensile Strengths of Fiberglas and Various Metals

FIBROUS glass is being used more and more as a reinforcement for plastics in commercial applications. In order to broaden their markets, plastics need reinforcement to increase their dimensional stability and impact strength without detracting from their inherent virtues of water resistance, corrosion resistance, molded-in color, low weight, and good electrical properties. Glass in fibrous form improves this stability and impact strength and does it better than any other known material.

Fibrous glass resists water and corrosion, is light in weight, possesses good electrical properties, and, most important, is the strongest material known. Figure 1 gives a comparison of the ultimate tensile strengths of aluminum, structural steel, monel metal, stainless steel, piano wire and Fiberglas.

As shown in Figure 2, the addition of fibrous glass increases the strength of the plastic in almost direct proportion to the volume of glass added. In this figure the tensile strength of a glass reinforced polyester resin molding is given as a function of the glass content, expressed as per cent. by volume.

Fibrous glass reinforced plastics are very strong, as shown in Figure 3, which compares the tensile yield strengths of three forms of reinforced plastics with those of aluminum and structural steel. These three different types of reinforced plastics differ not only in the volume of glass present, but also in the alinement of the fibers. The extremely light weight of reinforced plastics (about one-fifth the weight of steel) makes them even more desirable when weight factors are considered.

Developments in Processing

Because the reinforcement of plastics with fibrous glass is commercially desirable, the application of this material has shown a steady growth in the last four or five years. Because of this growth, research and development activities have been rather intensive, and new production processes and applications have resulted.

Since the original conception of Fiberglas, both textile yarns and fibers have been produced. The improvement of yarn construction and fabric weaves has been a continuing development. This development is of value in the plastics reinforcement field, but by far the most outstanding recent improvement has been the introduction of a new and improved finish for the fabrics which permits better adhesion of the plastic to the glass, thereby resulting in higher strengths and better water resistance of the finished product.

Finish 114[3] has been a standard commercial finish throughout the industry for about five years. Using this finish, the glass reinforced plastic has a flexural strength of about 58,000 psi., when dry, and about 35,000 psi. when wet. The introduction of Finish 136[4] has increased the physical properties of the molding and most dramatically increased its wet strength. With Finish 136, the reinforced

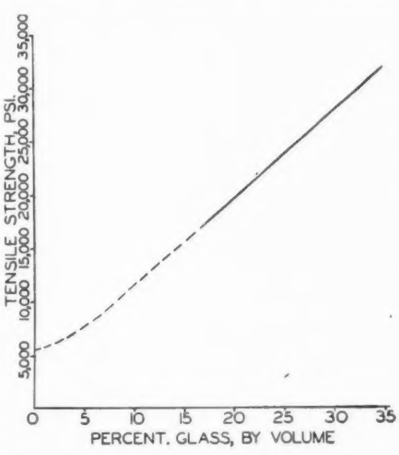


Fig. 2. Effect of Glass Reinforcement Content on Tensile Strength of Mat or Preform-Type Polyester Moldings

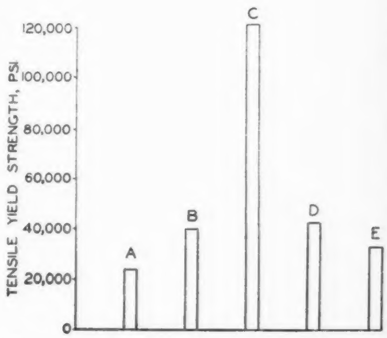


Fig. 3. Comparative Tensile Yield Strengths of Various Materials: (A) Glass Reinforced Polyester Mat Molding Containing 25% Glass by Volume; (B) Glass Fabric-Polyester Laminate Containing 45% Glass by Volume; (C) Glass Reinforced Polyester Rod Stock Containing 55% Glass by Volume; (D) 24-ST Aluminum; and (E) SAE 1020 Structural Steel

plastic has a flexural strength of about 68,000 psi., when dry, and about 58,000 psi. when wet.

Chopped strand glass mats for plastics reinforcement have been steadily improved, with most of the developmental emphasis placed upon binders, the resinous materials employed in small quantities to hold the chopped strands together in mat form. The new binders permit flexibility and precision in the choice of reinforcing products for specific applications.

The most recently introduced form of glass for plastics reinforcement is Fiberglas roving. This consists of 60 continuous Fiberglas strands, each comprised of 204 individual glass filaments, wound together to form a package containing approximately 8,500 yards of roving and weighing about 35 pounds. This roving package was designed for use in conjunction with a recently developed rotary cutter that chops the strands into uniform lengths. The use of Fiberglas roving and the rotary cutter provides a uniform, automatic system for feeding glass into any piece of process equipment.

The automatic preform machine is an excellent example of such a process. Here, in one operation, the roving is fed into the rotary cutter, where it is cut and dropped into an air stream. This stream, in turn, carries the cut strands into a collection chamber and on to a perforated metal screen in the shape of the item to be molded. A small quality of resinous binder is applied, and the resulting preform

[1] Presented before Elastomers & Plastomers Section, Twelfth International Congress of Pure & Applied Chemistry, New York, N. Y., Sept. 12, 1951.

[2] Plastics research and development laboratory, Owens-Corning Fiberglas Corp., Newark, O.

[3] Du Pont's Volan.

[4] Cowles Chemical Co.

is baked from one to three minutes to cure the binder and hold the preform together. Figure 4 illustrates such a preform being placed on a metal mold.

The polyester resin is then poured over the preform, and the mold closed. The resin mix consists of the polyester as received from the materials supplier, a small amount of peroxide catalyst, and about 35% inorganic, inert filler such as powdered calcium carbonate or aluminum silicate. The use of filled polyester resins improves the surface appearance of the molding, slightly increases its physical properties, and decreases materials costs. After a two- to three-minute cure at low pressures and a temperature of 250°F., the mold is opened and the finished piece removed.

Developments in Applications

The materials and methods previously described are being used in applications of which some are new and others are improvements on previous products.

The use of glass fibers as a plastics reinforcement has revolutionized the entire concept of a fishing rod and has become the standard of the industry. Here, the high proportion of glass to resin content makes the rod more nearly a resin bonded glass rod than a glass reinforced plastic item. This glass rod has the advantages of light weight, high strength, dimensional stability, water resistance, and resistance to fatigue. This application is an excellent example of a product where plastics, with proper reinforcement, have taken over a market previously held almost exclusively by wood and metal.

Another excellent application for glass reinforced plastics is the safety helmet, of which over a quarter of a million have been produced by the preform and matched metal mold method. The combination of light weight and high impact strength has made for acceptance of the helmet throughout the construction industry. An interesting point is the fact that on large jobs the various types of workers can be identified by the permanent, mold-in colors of their helmets.

Figure 5 shows a cross-sectional view of an extremely complex washing machine tub produced by Apex Electrical Mfg. Co. for one of its automatic washers. Despite the intricacy of design, this item is being molded in matched metal dies on a mass-production basis. The use of preformed glass reinforcement has effected a 50% savings both in cost and weight over the metal tubs previously used. In addition, lifetime service tests have proved that the glass-plastic performs more satisfactorily and for a longer time than the metal previously used.

Another interesting new application for the reinforced plastic is in Roto-Signals, wind-rotated traffic signs for use in all danger areas along streets and highways. Several large construction firms and public utilities are already specifying that these signs be used when their men are on a job. The lightweight reinforced plastic vanes permit a lighter frame and bearing than were previously possible with metal components, thereby giving a most satisfactory sign at lower cost. In addition, the plastic signs do not bend, dent, chip, or corrode.

Reinforced plastic in the form of corrugated sheets are gaining more and more acceptance as an outstanding material for skylighting in industrial buildings. The weather resistance of these sheets, together with their translucency and extreme ease of installation make their use highly profitable. Markets for this material in the decorative field are being explored, and the military services are also experimenting with it for use in temporary shelters.

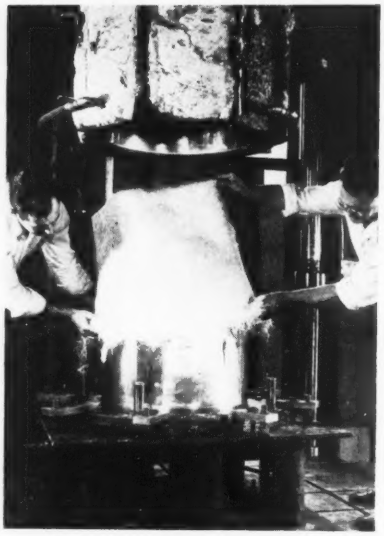


Fig. 4. Glass Fiber Preform with Resinous Binder Being Placed on a Metal Mold

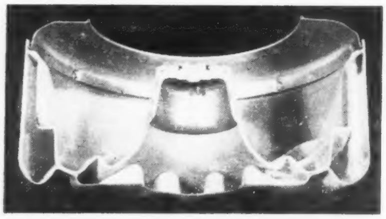


Fig. 5. Cross-Sectional View of Complex Washing Machine Tub Made of Glass Reinforced Polyester Plastic

The entire industry of materials handling containers is being changed by the introduction of fibrous glass reinforced plastic tote boxes. The use of this material permits great flexibility in design and gives boxes that are light in weight and easy to handle. Their extreme durability also results in decreased costs for the user.

Boats up to 42 feet in length are now being manufactured out of glass reinforced plastics. Of relatively low cost, these boats are durable, strong, light, resistant to the action of marine borers, and need practically no maintenance. The one-piece construction and molded-in color eliminate the need of caulking or painting the plastic boats.

Prospects for Future Developments

Developments are under way that give promise of providing new and superior materials for plastics reinforcement. A new type of reinforcing mat is being developed which will make possible the achievement of much higher strengths at relatively low cost. By utilizing this new mat as its potentialities indicate, very high directional strengths can be obtained and controlled, thereby opening up new markets for glass as a plastics reinforcement material.

The coating or sizing on the bare glass filaments, as they are formed, will also be improved so that higher strengths can be obtained from the present products. A rather long-term development program is directed toward developing a sizing which, after application to the glass fiber, will permit the weaving of fabrics suitable for plastics reinforcement without first having to clean the fabric and apply an after-finish. Resin manufacturers are doing considerable work on the development of higher temperature resistant polyesters to provide greater fire resistance.

From the standpoint of processing and fabrication, the preform operation is being made more fully automatic. A molding material, consisting of the proper amounts of glass, resin, catalyst, and filler, is being developed which should permit use of the transfer or plunger molding technique to reinforced plastics. Much effort is being applied toward improving the surface finish of the molded articles so that the most rigid requirements can be met without painting. The reinforcement of hydraulic cements with fibrous glass is being investigated and shows promise of affording an entirely new low-cost inorganic molding material with extremely good heat and fire resistance. The use of glass as a reinforcement in the injection molding field is also being studied and should, in the future, yield injection molded articles of high strength and low cost at extremely high production rates.

A large number of new applications for glass reinforced plastics are expected to materialize in the near future. These will include irrigation pipe, oil pipe, extremely large boats, automotive components, large-area refrigerator moldings, structural building sections, hot water tanks, bath tubs, vacuum cleaner housings, football helmets, and river barges. Incidentally, a 70-foot barge is now under construction.

Summary and Conclusions

Over a period of the past 10 years the reinforced plastics industry has grown slowly and steadily. At present the industry is still relatively small, comprising about 100 fabricators, but it utilizes a new material with design potentials that are opening up new fields of application. The success of these materials to date, and their potentials, indicate a future of continued growth.

Help Wanted

THE Naval Air Material Center, Philadelphia, Pa., has an urgent need of professional personnel among which are general engineer, metallurgist and technologist (rubber), (packaging and preservation), (plastics), (textile), and (general). These vacancies are at a grade GS-5 level with pay ranging from $3,100 to $6,400 a year. These positions are concerned with research and development in the experimental laboratories of the Naval Air Material Center.

Applications are being accepted for indefinite appointment, and interested persons should file an Application for Federal Employment, Standard Form 57, with the Industrial Relations Department, Naval Air Material Center, Naval Base, Philadelphia 12, Pa. If information regarding specific types of vacancies is desired, the same address should be used.

Application for Federal Employment, Standard Form 57, may be obtained from any first- or second-class post office or from any Civil Service Regional Office.

The Behavior of Carbon Black in Rubber and Plastics[1]

W. R. Smith[2]

HIGH polymers have been classified as elastomers and plastics primarily on the basis of the ease and degree to which they can be deformed at room temperature, and the speed and extent of recovery of the polymer after such deformation. Thus an elastomer such as natural rubber has a low initial elastic modulus and can be stretched 1,000% or more, with nearly complete recovery upon release. On the other hand a plastic such as cellulose acetate may have an initial modulus 10 or 100 times as great as natural rubber and an extensibility of less than 100%, with a slow and incomplete recovery upon relaxation.

Whether it is an elastomer or a plastic, the properties of the raw polymer must be modified considerably before it can be fabricated into a commercially useful article. These modifications with which the rubber and plastics industries are concerned rarely involve the chemical nature of the polymer, but are rather modifications or enhancements of the forces acting along and between the polymer chain molecules. In fact, these are modifications of those forces responsible for the original classification of the polymer as a rubber or plastic.

In processing a polymer it is first necessary to attain sufficient flow so that the material will properly assume the shape of the mold. The rubber chemist diminishes elastic properties and enhances plastic properties by "breaking down" the rubber on a roll mill or Banbury mixer. The plastic chemist enhances flow by adding plasticizers to his polymer. The next step in easing fabrication consists of employing elevated temperatures during molding so as to lower viscosity further and improve flow of the polymer through the mold.

The rubber chemist then introduces sulfur cross-links through vulcanization to restore elasticity. Since the cohesive forces between the polymer chains in a plastic are greater than those in rubber, or, to put it another way, since the softening point of a plastic is generally considerably above room temperature, plastics do not require the addition of further cross-links to restrict plastic flow.

The rubber chemist next effects a further and extremely significant modification in the properties of rubber, both natural and synthetic types, by the addition of some 40-50 parts (if he is making a tire tread) of carbon black. By contrast, when the plastics chemist uses carbon black in his product it is only in amounts of 2-5%. This amount is sufficient to color the stock, but does not alter significantly the other properties of the plastic polymer.

Effect of Carbon Black in Rubber

The ability of carbon black to reinforce rubber has been recognized for some 30 years and results in greatly enhanced tire wear. The road wear of a carbon black-loaded tire tread is more than 10 times that attained by the use of other fillers. This phenomenal improvement in the service life of elastomers has naturally attracted the attention of the plastics chemist and has led to inquiries as to whether equally beneficial effects could be derived from the introduction of high loadings of carbon black in plastics.

Before turning to the data, let us consider the basis of these inquiries and, more specifically, what beneficial effects are to be anticipated. The term "reinforcement" has been overworked in recent years and has been used rather loosely with a connotation implying an improvement in all desirable product properties. In elastomers carbon black does impart a phenomenal improvement in resistance to abrasive wear, and it is to this quality that the terms "reinforcement" and "reinforcing pigment" apply.

The mechanism whereby carbon black accomplishes this improvement in wear is still obscure. We recognize certain definite changes in the physical properties of rubber brought about by the presence of carbon black and can measure these changes very adequately in the laboratory. The elastomer properties most profoundly affected are the stress-strain or elastic properties, in fact, those very properties which are generally employed in differentiating between elastomers and plastics.

Carbon black at optimum loading does not decrease the tensile strength of natural rubber. In fact, the tensile strength of natural rubber increases only by 200-300 pounds; while that of GR-S rubber is increased some tenfold. A distinctive characteristic of a reinforcing pigment is the fact that the modulus (force necessary to produce a given elongation) is increased far beyond that anticipated from theory,[3] without a loss of corresponding magnitude in the extensibility or elongation properties of the rubber.

As yet, no one has successfully equated these changes in physical properties of compounded rubber with resistance to abrasive wear. These changes obviously must be interrelated, but to what degree and in what combination remains to be discovered. Accordingly, it appears logical to assume that carbon black reinforcement, as described here, is a phenomenon that can be experienced only with elastomers. It begins to display itself only in polymers capable of elastic deformations in the order of 300%. This figure excludes plastics by our present definition.

Effect of Carbon Black on Plastics

Data on the properties of carbon black loaded polystyrene and cellulose acetate stocks are presented in Table 1.

TABLE 1. EFFECT OF VARIOUS CARBON BLACK LOADINGS ON PHYSICAL PROPERTIES OF PLASTIC

	Black Loading*	Heat Distortion Temperature, °C.	Flexural Strength, Psi.	Impact Strength (Notched Izod), Ft. Lbs./In.
Polystyrene	0	80	6,160	0.28
	10	83	4,530	0.21
	20	84	4,070	0.21
	30	85	3,700	0.22
Cellulose acetate†	0	55	6,500	1.76
	10	56	6,700	0.97
	20	57	7,300	0.94
	30	60	7,500	0.90

*Parts of Spheron 6 (MPC) black per 100 parts of polymer.

†Polymer stock: 100 parts cellulose acetate, 24 parts diethyl phthalate, and 16 parts dimethyl phthalate.

These data are fairly typical, and no significant improvement in physical properties of the polymer is attained. In general, the stocks stiffen, display an increase in heat distortion temperature, and impact strength is markedly impaired. While the usual physical properties of plastics are not significantly improved by the use of high loadings of carbon black, it has recently been demonstrated[4] that low loadings (2-5%) of carbon black exert a very marked improvement in the weather aging of polyethylene. Similar experiments on other plastics suggest that this improvement is not restricted to polyethylene, but apparently extends to all plastics which undergo weather aging.

Table 2, taken from Wallder's paper,[4] demonstrates in rather striking fashion the efficiency of carbon black in protecting polyethylene from weather aging.

TABLE 2. EFFECT OF CARBON BLACK LOADING ON ACCELERATED AGING OF POLYETHYLENE*

Carbon Black Loading, % by Wt. of a Medium Color Channel Black	Hours Aging to Become Brittle at —40° C.
0.0	75
0.1	110
0.2	400
0.5	650
1.0	1,350
2.0	2,375
5.0	2,375

The original unloaded polyethylene stock had an initial brittle point of —76°C. After 100 hours in the Weather-Ometer the unloaded stock had a brittle point of —40°C. Stocks loaded with 2% of channel black endured 2,300 hours in the Weather-Ometer before they failed at —40°C. Embrittlement or aging in this instance is evidently an oxidative effect activated by ultra-violet radiation. Since carbon black is highly absorbing in the ultra-violet,[5] its effectiveness in enhancing the life of plastics can best be described as a "screening" action, protecting the polymer from the activating effect of ultra-violet radiation.

The effectiveness of carbon blacks in this application is a function of their particle size. As the carbon blacks become blacker, efficiency improves. It is only necessary to use such loadings of carbon black as are required to produce maximum "blackness" in the plastic. This loading usually does not exceed 5% and is sufficiently low that it does not seriously impair the physical properties of the plastic.

Summary and Conclusions

While carbon black does not reinforce plastics in the same sense that it enhances the physical and wear properties of rubber, it does effectively enhance the service life of plastics by increasing their resistance to weather aging rather than abra-

[1] Based on a talk presented before the Quebec Rubber & Plastics Group, Montreal, P. Q., Canada, Mar. 29, 1951.

[2] Chief research chemist, Godfrey L. Cabot, Inc., 77 Franklin St., Boston 10, Mass.

[3] H. M. Smallwood, *J. Appl. Phys.*, 15, 758 (1944).
E. Guth, *Ibid.*, 16, 20 (1945).

[4] V. T. Wallder *et al.*, *Ind. Eng. Chem.*, 42, 2320 (1950).

[5] A. J. Wells, W. R. Smith, *J. Phys. Chem.*, 45, 1055 (1941).

sive wear. In closing, the following quotation seems appropriate. It is taken from page 27 of "The Manufacture of India Rubber" by Thomas Hancock, in 1857:

"In the course of my early progress I found that some of the rubber I employed was very quickly decomposed when exposed to the sun. As the heat was never more than 90°, and rubber when exposed to artificial heat of a much higher temperature was not injured by it, I suspected that light had some effect in producing this mischief. To ascertain this, I cut two squares from a piece of white rubber; one of these I colored black and exposed the two to the sun's rays; in a short time the piece that had been left white wasted away, and the sharp angle disappeared, and it assumed the shape of a piece of soap that had been some time in use; the blackened piece was not at all altered or affected. The lesson taught me by this experiment was of great value ever after."

Preliminary Program for SPE Conference

PRELIMINARY program plans have been announced for the eighth annual national technical conference of the Society of Plastics Engineers, Inc., to be held January 16-18 at the Edgewater Beach Hotel, Chicago, Ill. The tentative program includes the following papers and discussions:

"Plastical Archeology," Johan Bjorksten, Bjorksten Research Laboratories.

"Extrusion of Large Piping," E. C. Blackard, Tennessee Eastman Corp.

"Modified Phenolics," Wyman Goss, General Electric Co.

"Molding of Thick Sections," Gordon Thayer, Dow Chemical Co.

"Reinforced Plastics"—a panel discussion under the chairmanship of A. J. Wiltshire, Apex Electric Mfg. Co.

"Mold Design"—a panel discussion under the chairmanship of Carl F. Massopust, General American Transportation Corp.

"Impact Styrenes and Copolymers," Paul Elliott, Naugatuck Chemical Division, United States Rubber Co.

"New Applications and Design Problems"—a panel discussion under the chairmanship of Jean Reinecke, industrial designer.

"Preplasticizers," by a representative of Hydraulic Press Mfg. Co.

"Extrusion of Vinyl Film," A. M. Stover, Naugatuck Chemical.

"Marketing of Plastics," Corliss Cummins, Dow Chemical, and Edward F. Kennedy, Monsanto Chemical Co.

Paper by G. P. D'Alelio, Koppers Co., Inc.

"Military Applications"—a symposium under the chairmanship of Ken Gossett, Gossett & Hill.

Reading of winning papers in the 1951 SPE National Prize Paper Contest.

Section Meeting Reports

Procurement of Plastic Items

Talks on the "Procurement of Plastic Items," by Frank Ziherle, Army Ordnance Department, Chicago District, and Russell Ehlers, Army Quartermaster Corps, featured the October 24 joint dinner-meeting of the Chicago Section, SPE, and Midwest Chapter, SPI. Held at the Builders' Club, Chicago, Ill., the meeting was attended by 120 members and guests.

Mr. Ziherle described the procedure for placing bids on plastic items in the Chicago Ordnance District. He discussed the items now being purchased in the District and also mentioned some that may be added to the list in the near future. The use of plastics in military products is not great at present, but as other materials become short, it is expected that more and more plastics will be specified. The speaker recommended a visit to the nearest arsenal to inspect the products purchased in the area and suggested that manufacturers contact the Ordnance purchasing department if they can make any part cheaper, better, or of less critical material.

Dr. Ehlers discussed the research and development division of the Quartermaster Corps, its make-up and functions. Much of the work of the Plastics Compositions Section is devoted to investigating new materials and determining how critical materials can be replaced by others that are more available. The conversion of a part from metal to plastic requires a comprehensive consideration of the physical and chemical properties of both materials. When this has been done, specifications are written; bids are solicited; prototypes obtained, and the specifications revised to include any modifications found necessary during the preparation of the prototypes.

Preceding the main part of the program, Ben W. Rau, G. Felsenthal & Sons, Inc., spoke briefly on the SPI New England Conference and on the effect on the plastics industry of recent OPS and NPA rulings.

Joint New York-Newark Meeting

The New York Section, SPE, was host to the Newark Section at a joint dinner-meeting on November 14 at the Gotham Hotel, New York. Approximately 120 members and guests of the two groups were present and heard H. A. Meyrick, Industrial Mfg. Co., discuss 'Mold Temperature Control for Injection Molding."

The speaker noted that while control of mold temperature is accepted by the injection molders as a necessity, this temperature is not controlled so closely as are molding time and pressure. Graphically analyzing the effect of temperature on the molding cycle, Mr. Meyrick showed how improper control of temperature can lengthen the cycle and appreciably affect production rates. Temperatures are controlled on the basis of measurements made by pyrometers inserted in wells in the mold. Standard pyrometers show an actual range of 15-20° around the present temperature range; while proportioning-type pyrometer temperature controls narrow this differential down to about 8° above and below the present temperature. The speaker recommended temperature control based on measurements obtained with a pyrometer having an input controller; such a system provides temperatures within 3° of the setting.

Maximum water cooling and molding efficiency are obtained when the cooling water leaving the mold is at the same or very close to the same temperature as the mold surface in contact with the thermoplastic. Such cooling requires that the water be in contact with the mold metal. While water cooling of the bolster plate beneath the mold can give uniform mold temperatures, the interface between the plate and mold acts as a resistance to heat flow and slows down the cooling rate, with resultant lengthening of the molding cycle and loss of production. Under such a system the exiting water is at a temperature 20-90° below that of the molding surface. Emphasizing that uniformity of mold surface temperature is in itself no indication of water efficiency in heat removal, the speaker urged proper engineering of molds to provide for water cooling passages in the mold itself.

New York Section President George Baron, Ideal Plastics Corp., presided over the meeting and welcomed the Newark members in the short business session preceding the talk. Newark President Peter W. Simmons, Dow Chemical Co., acknowledged the welcome and expressed the belief that the excellent relations of the two groups, as exemplified by the semi-annual joint meetings, would continue in the future.

Table favors were distributed through the courtesy of Harold H. Schwartz, Empire Brushes, Inc., and the meeting concluded with a drawing for door prizes donated by Durite Division, Borden Co.; Celanese Corp. of America; Monsanto Chemical Co.; and Stott Tool & Machine Co.

Plastics Show a Sell-Out

INDUSTRIAL response to the Fifth National Plastics Exposition, to be held in Exposition Hall, Philadelphia, Pa., March 11-14, has indicated that the event will be a complete sell-out. No fewer than 110 exhibitors were allotted space at a drawing late in September, accounting for all the exhibit space then laid out. The sponsoring body, The Society of the Plastics Industry, Inc., then authorized the setting up to 19 additional booths available on a first-come first-served basis. Within a few weeks, many of these added booths had been reserved.

In conjunction with the show, the SPI will hold meetings in the ballroom adjoining Exposition Hall, and the Bellevue-Stratford Hotel has been designated the headquarters during the Exposition. Exhibitors at the show will include plastics manufacturers, fabricators, molders, laminators, and machinery and equipment manufacturers, as well as companies representing the scores of industries whose products involve the use of plastics.

New SPI Committees

The formation of a marketing committee and the expansion in scope of the functions of the public relations committee has been approved by the SPI board of directors. These changes are in accordance with a recommendation submitted by a group of plastics industry members active in the Society's informative labeling program. SPI President Gordon Brown, Bakelite Co., has appointed Amos Ruddock, Dow Chemical Co., as chairman of the new marketing committee. Edmund E. Kennedy, Mosanto Chemical Co., has been appointed chairman of the public relations committee. Invitations to serve on the two

(*Continued on page* 346)

Scientific and Technical Activities

Garvey and Walsh N. Y. Group Speakers

THE New York Rubber Group meeting of October 26 at the Henry Hudson Hotel, New York, N. Y., heard talks by B. S. Garvey, Jr., laboratory director, Sharples Chemicals, Inc., Devon, Pa., and Robert H. Walsh, rubber laboratory, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. About 200 members and guests were present at the afternoon technical session and the dinner-meeting.

At the afternoon session M. R. Buffington, consultant, chairman of the Group, read a letter from J. H. Fielding, 1951 chairman, Division of Rubber Chemistry, A. C. S., thanking the local committee on arrangements for the September meeting of the Division in New York for its work in making that meeting the success that it was.

The nominating committee composed of C. O. Davidson, Binney & Smith Co., D. E. Jones, American Hard Rubber Co., Bryant Ross, Sharples Chemicals, and O. J. Lang, Vulcan Proofing Co., presented the following slate of officers for the Group for 1952: chairman, J. S. Corrigall, R. T. Vanderbilt Co.,; vice chairman, G. N. Vacca, Bell Telephone Laboratories; executive committee members for three years, Joseph Breckley, Titanium Pigments Corp., Arthur J. Lang, H. V. Hardman Co., A. R. Lewis, Monsanto Chemical Co., and Frank Malm, consultant; sergeant-at-arms, G. H. Provost, United States Rubber Co.; and secretary-treasurer, Peter P. Pinto, *Rubber Age*. The nominations were unanimously approved by a voice vote of the membership.

The subject of Dr. Garvey's talk was "Heat History and Compounding." The relation between heat history, as represented by the time of milling on a hot mill, and the scorch time, cure time, and vulcanization time (defined as cure time minus scorch time) was investigated for two natural rubber, wire insulation compounds.

The time of milling on a hot mill was taken as a measure of heat history of a compound. Scorch time was measured in three ways: (1) on the Mooney machine, (2) by hot milling to scorch, and (3) from a series of press cures at one-minute intervals. Cure time was determined in two ways: (1) on the Mooney machine and (2) from a series of press cures at one-minute intervals. In the latter case the cure time selected was that of the first cure to reach a definite modulus and tensile strength.

A large number of batches were mixed and subjected to various times and temperatures of hot milling. The press scorch time was found to be slightly shorter than the Mooney scorch time. With one compound the mill scorch time was fairly close to the Mooney scorch time. With the other the mill scorch time was very much longer. It was shown that in the Mooney machine part of the stock is working and part is at rest during the test runs.

The time to reach a given technical cure decreases with increasing heat history of the stock. Therefore variations in heat history of the uncured stock would account for some of the mysterious variations in cure which are encountered in production.

For a given compound, the vulcanization time is constant within narrow limits, and the variations in cure time are due to varying amounts of scorch time used up in processing.

A stock can be processed and cured at the same temperature provided factory processing can be so controlled that the heat history can be maintained constant within narrow limits.

"Neoprene Latex in the Paper Industry" was the topic selected by Mr. Walsh. He first pointed out the last three years have seen a rapid development in the use of elastomers in the paper field. This growth in the case of neoprene latices has actually coincided with the development of two latices—Neoprene Latex Type 842-A, used primarily for saturation, and a new neoprene latex, Type 735, especially made for beater or wet end application to pulp. The addition of small amounts (5%) of this beater latex results in paper having excellent wet strength, increased dry physical properties, improved impact strength, energy absorption, softness, sizing, and many other desirable properties.

Commercial applications for these beater-treated neoprene papers are as filter medium, chemical resistant bags, printed paper, linoleum backing, tray liners, packaging papers and sandpaper and masking paper base.

Neoprene has been used for many years as a saturant for paper. It produces a sheet having high tensile and internal bonding strength, high edge and internal tear and water resistance. Neoprene, moreover, is unique in imparting snap and resilience to saturated paper.

Neoprene Latex Types 572 and 700 have been used as adhesives for producing a waterproof paper seal. A promising lead indicates that Neoprene Latex Type 700 in combination with specially prepared rosin ester emulsions might be used for bonding polyethylene to paper and also in adhering polyvinyl chloride to paper. Neoprene as a paper adhesive combines resistance to chemical attack with oil resistance.

Butyl Curing Rate

A TALK on "A Chemical Method for Predicting the Cure Rate of Butyl Rubber and Its Application to Plant Control," by Lorne Currie, Polymer Corp., Ltd., featured the November 13 joint dinner-meeting of the Ontario Rubber Section and Wellington-Waterloo Rubber Group, C.I.C. Held at the Granite Curling Club, Kitchener, Ont., the meeting was attended by 60 members and guests.

Mr. Currie said that the stress-strain method of determining modulus is unsatisfactory because of poor accuracy, time involved in analysis, and sensitivity to atmospheric and other test conditions. A chemical method of predicting the cure rate of butyl was described by the speaker, who said that the new technique has been applied to production in the butyl unit of Polymer's Sarnia plant, with resultant improvement in product uniformity. This method may well render obsolete the stress-strain method for control of cure rate in butyl production.

Rubber-to-Metal Bonding

A SYMPOSIUM on the bonding of rubber to metal was the highlight of the Chicago Rubber Group's fall dinner-meeting, held November 9 in the Morrison Hotel, Chicago, Ill. Some 260 members and guests heard the discussion, at which H. A. Winkelmann, Dryden Rubber Division, Sheller Mfg. Corp., acted as moderator. Panel members included S. L. Brams, Dayton Chemical Products Laboratories, Inc.; C. G. Cashion, Xylos Rubber Co.; M. E. Jones, Marbon Corp.; G. C. Maassen, R. T. Vanderbilt Co., Inc.; H. B. Puff, Durex Plastics & Chemicals, Inc.; and R. Smith-Johannsen, General Electric Co. A transcript of the discussion will be published in a future issue of India RUBBER WORLD.

A special feature of the meeting was exhibits by six manufacturers of bonding agents showing the applications of their products for rubber-to-metal bonding. General Electric Co. displayed two adhesives for silicone rubbers, SS-15 and SS-64; the former requires the use of a special primer SS-67. The B. F. Goodrich Co. displayed Dri-lock, for bonding GR-S and natural rubber to brass plated metals, and Plastilocks 102, 315, and 604 for bonding nitrile rubber to ferrous metals, brass, and magnesium. Harwick Standard Chemical Co., sales agents for Dayton, exhibited eight different types of Thixon bonding agents for use on brass plated or primed metal surfaces.

The Marbon Co. exhibit showed applications of the four Ty-Ply adhesives for bonding natural and synthetic rubbers to ferrous and non-ferrous metals. A new adhesive, Braze, was shown by R. T. Vanderbilt as being suitable for bonding natural rubber, GR-S, neoprene, and butyl to various types of metals. Xylos Rubber Co. displayed applications of Loxite 3000 for bonding rubber to ferrous metals, brass, aluminum, and zinc, and Loxite 1055, used as a cover cement for Loxite 3000.

Plant Maintenance Show

MANLY FLEISCHMANN, DPA administrator, will head a group of 56 speakers in the most extensive discussion of plant maintenance problems ever undertaken at the Plant Maintenance Conference, to be hold on January 14-17 in Convention Hall, Philadelphia, Pa. The Conference, which will be held in conjunction with the Plant Maintenance Show, will have as its general chairman L. C. Morrow, *Factory Management & Maintenance*. More than 14,000 persons are expected to attend, and 225 companies are expected to exhibit at the Show. The Conference is sponsored by the American Society of Mechanical Engineers, and the Society for the Advancement of Management.

The American Society of Lubrication Engineers will conduct the panel discussion on lubrication. The discussions will be divided into more than 30 separate sessions covering the needs of the chemical, metal, aircraft, food, glass, oil, printing, pulp and paper, textile, and woodworking industries.

Williams on Compounding

THE Los Angeles Rubber Group, Inc., held a regular meeting on November 6 at the Mayfair Hotel, Los Angeles, Calif. Sixty members and guests, present at the afternoon technical session, heard Ira Williams, J. M. Huber Corp., speak on "Compounding."

Mr. Williams explained that from the internal sense, rubber compounds are divided into three parts: the matrix, the chemicals and the fillers. He described how the matrix might be single or poly phase.

Chemicals are generally soluble in the rubber and, therefore, become a part of the matrix.

Fillers are used to change the characteristics of the matrix, Williams said. Certain fillers tend to impart a degree of "wetness" to the compound. Fillers of this type include carbon black, zinc oxide, zinc sulfide, iron oxide, and lignin. Other fillers, such as clays, whitings, barium sulfate, and calcium silicate, seem to decrease the "wetness" of the compound. The speaker noted that the "wet" pigments are not necessarily easily dispersed.

The shape of the filler particle is of primary concern, Williams declared. Rubber flows in layers like water, and particle shape of the filler will affect flow as well as tear resistance and other physical properties. Spherical shapes have the least effect on flow, although excesses of any shape give a tendency to pack or flocculate in groups. Needle-shaped particles tend to flocculate more than spherical shapes, which, in turn, flocculate more easily than cubical shapes. Experiments on the particle size and shape of clays have shown that the viscosity of the rubber compound becomes lower as the filler particle shape becomes more nearly spherical.

The evening dinner-meeting was Ohio Rubber Co. night, with table favors and door prizes contributed by that firm. Some 238 members and guests attended the dinner-meeting and heard Bob Ringer speak on "Anything for a Laugh." The talk emphasized the importance of humor in every-day life for improving the health and mental outlook.

Other Tlargi Activities

The Group's educational committee announced that a course in Rubber Technology II will be given at Los Angeles City College, commencing February 2. This is an advanced course and will be under the direction of John Ryan, Goodyear Tire & Rubber Co.

The campaign to raise funds for the Tlargi Rubber Technology Foundation at the University of Southern California is receiving the hearty support of the local rubber industry. The Group's finance committee reported total contributions to date of $21,500.

The Group's new officers and directors for 1952 will be announced at the December meeting, upon completion of the mail balloting. The candidates follow: chairman, R. L. Short, Kirkhill Rubber Co.; associate chairman, D. C. Maddy, Harwick Standard Chemical Co.; vice chairman, L. E. Budnick, Ohio Rubber, and R. N. Phelan, Atlas Sponge Rubber Co.; treasurer, W. M. Anderson, Gross Mfg. Co., and F. C. Johnston, Caram Mfg. Co.; secretary, R. E. Bitter, B. F. Goodrich Chemical Co., and A. H. Federico, C. P. Hall Co. of California; and directors, R. E. Behrman, United States Rubber Co., W. E. Boswell, Thiokol Corp., R. L. Bowen, Xylos Rubber Co., C. H. Kuhn, Master Processing Corp., J. B. Larkin, Patterson-Ballagh Division of Byron Jackson Co., H. Libkind, Western Insulated Wire Co., G. W. Miller, W. J. Voit Rubber Co., D. M. Sheppard, Goodyear, and R. B. Stewart, Dow Corning Corp.

New Vanderbilt Products

AMAX and Braze, two new products for the rubber industry, are described in the November-December, 1951, issue of "The Vanderbilt News," published by R. T. V[redacted]bilt Co., Inc., 230 Park Ave., New Y[redacted] N. Y.

Amax [redacted] a modified thiazole-type accelerator which appears to be safer processing than Captax and Altax, but equally satisfactory in curing strength. Said to be n-oxydiethylene benzothiazole-2-sulfenamide, Amax is a dustless tan powder having a specific gravity of 1.34, molecular weight of 252.34, and melting point of 74-85° C. Extensive test data are given in the publication on the physical and aging properties of natural and GR-S rubber stocks accelerated with Amax, either alone or in combination with other accelerators.

Braze, a new adhesive for bonding natural, GR-S, or neoprene rubbers to metals, is a free-flowing homogeneous liquid solution of halogenated rubber derivatives of selected types, along with the modifying agents required to assure uniformity, stability, and satisfactory aging. The material exhibits a mass-tone of deep ruby color and dries to a thin, translucent film having a burgundy color. The liquid has a specific gravity of 1.01, total solids content of 22%, Brookfield viscosity of 115-125 seconds, and a typical xylene odor. The discussion in the publication covers metal preparation, compound selection and preparation, application of the adhesive, and properties of the bond.

Polygen Discussed

THE November 21 meeting of the Washington Rubber Group, held in the auditorium of the Pepco building, Washington, D. C., featured a talk on "Polygen — A New Class of Synthetic Rubbers," by Guido H. Stempel and Edward V. Osberg, General Tire & Rubber Co.

The versatility of the Polygen system, presently limited commercially to specific combinations of high Mooney butadiene-styrene copolymers and petroleum oils, was discussed by the two speakers. This principle was shown to be the basis of a whole new group of rubbers covering a wide variety of polymers and an almost unlimited number of additives. The Polygen system is expected to lead to many new and interesting properties hitherto unobtainable by conventional polymerization techniques.

After comparing the properties of the present standard Polygen with those of cold GR-S, Osberg and Stempel also discussed the economic implications of the new system, emphasizing the savings possible in both raw materials and processing. Large-scale usage of Polygen-type rubbers, according to the speakers, could eliminate the need of alcohol butadiene and free a large quanity of styrene for use by the plastics industry.

Telephone Wire Needs

A TALK on "Rubber Covered Telephone Wire," by George N. Vacca, Bell Telephone Laboratories, Inc., featured the November 2 dinner-meeting of the Philadelphia Rubber Group, held at the Poor Richard Club, Philadelphia, Pa., with 115 members and guests in attendance.

Mr. Vacca noted that, except for telephone cord and carrier pair cable, rubber and other vulcanizable materials are used only on telephone wires intended for outdoor use in the Bell System. The speaker discussed the different types of rubber covered wires with regard to the various types of insulations and jackets devised to meet service requirements. With some insulations the emphasis is on physical properties; while electrical properties are important in others. Jackets must be weather resistant for outdoor use. In all cases, rubber compounds are chosen for longest possible trouble-free service.

Telephone wires for the Bell System are made in the Point Breeze, N. J., plant of Western Electric Co. by the recently installed room-temperature compound process. This process features the cooling of compounds to room temperature immediatley after mixing. All portions of a compound are thereby at a uniform temperature and plasticity as they go into the extruder. The working which the compounds receive, while being warmed up in the extruders, has been found sufficient to permit appreciable shortening of Banbury mixing cycles. Other important advantages of the method, Mr. Vacca said, are reduction in the amount of scrap resulting from the pre-vulcanization associated with hot compound feeding and virtually complete elimination of diameter variation of the insulation.

S. G. Byam, E. I. du Pont de Nemours & Co., Inc., and vice chairman of the Division of Rubber Chemistry, A. C. S., also spoke briefly on the relations of the local rubber groups with the Division.

Butyl Processing Aid

OUTSTANDING results in easing the processing of butyl rubber compounds are said to be obtained by using Kenflex hydrocarbon resin, made by Kenrich Corp., New York 5, N. Y. Use of 10 parts Kenflex A on the rubber is claimed to give compounds possessing molding and extruding characteristics comparable to polyethylene. Besides, such addition of Kenflex to butyl does not change the initial corona value, power factor, or resistance to ozone of the stock.

Stempel at Buffalo Group

A TALK on "The Practical Utilization of High Mooney Viscosity GR-S," by G. H. Stempel, The General Tire & Rubber Co., highlighted the October 23 dinner-meeting of the Buffalo Rubber Group, held at the Hotel Westbrook, Buffalo, N. Y., with 61 members and guests attending. Mr. Stempel's talk was similar to that which he gave before the September 20 meeting of the Southern Ohio Rubber Group and was based on the articles appearing in our June-August issues. After-dinner speaker was Henry K. Epple, Irving Airchute Co., on "The Hitler Regime."

Additional Experimental GR-S Polymers and Latices

THE table below gives the additions and changes in the list of experimental GR-S polymers and latices authorized by the Synthetic Rubber Division, RFC, during the period from September 27 to November 26, 1951.

Normally, experimental polymers will be produced only at the request of the consumers, and 20 bales (one bale weighs approximately 75 pounds) of the original run will be set aside, if possible, for distribution to other interested companies for their evaluation. The 20 bales, when available, will be distributed in quantities of one bale or two bales upon request to the sales division of the Synthetic Rubber Division, or will be held for six months after the experimental polymer was produced, unless otherwise consigned before that time. Subsequent production runs will be made if sufficient requests are received.

These new polymers are experimental only, and SRD does not make any representations or warranties of any kind, expressed or implied, as to the specifications or properties of such experimental polymers or the results to be obtained from their use.

X-Number Designation	Polymer Description
	Changes in Previously Announced Polymers
X-580 GR-S, X-581 GR-S, X-582 GR-S	Shortstopped with sodium or potassium dimethyl dithiocarbamate and sulfur as either polysulfide or polyamire.
X-620 GR-S	Stabilized with 1.25% ELGI instead of 1.5 parts ELGI.
X-657 GR-S, X-658 GR-S	Reaction temperature corrected to read "54-57° F."
X-668 GR-S, X-669 GR-S	Shortstopped with sodium or potassium dimethyl dithiocarbamate and either polyamine H (or equivalent) or sulfur as sodium polysulfide, instead of with DNCB.
X-671 GR-S	Mooney viscosity (ML-4 at 212° F.), 50 ±4.
X-673 GR-S Latex	Butadiene/styrene charge ratio 70/30, polymerized at 50° F. Activated with PMHP or equivalent. Emulsified with potassium oleate; shortstopped with potassium or sodium dimethyl dithiocarbamate. Total solids, 47.0-49.9%. Mooney viscosity of the contained polymer (ML-4 at 212° F.), 70-100.
Note:	In the future the oxidant for experimental low-temperature polymers using DIP, CHP, PMHP, Diox 7, or mixtures thereof, will be described by the expression, "PMHP or equivalent."
	New Polymers and Latices
X-674 GR-S	Same as X-496 GR-S-SP, except stabilized with 1.25% ELGI (on the rubber).
X-675 GR-S	Similar to GR-S-60, except shortstopped with sodium or potassium dimethyl dithiocarbamate and sulfur as either sodium polysulfide or Polyamine H (or equivalent). Stabilized with 1.25% Wingstay S (on the rubber) and coagulated with salt and acid.
X-676 GR-S	An oil-rubber masterbatch of 100 parts of the base polymer described in X-628 GR-S, and 37.5 parts of Circosol-2XH.
X-677 GR-S	X-580 GR-S masterbatch in which the carbex is dispersed with an Entoleter.
X-678 GR-S Latex	Butadiene/styrene charge ratio 70/30 polymerized at 50° F.; activated with PMHP or equivalent and diethylenetriamine; emulsified with potassium oleate. Shortstopped with sodium or potassium dimethyl dithiocarbamate. Mooney viscosity of the contained polymer (ML-4 at 212° F.), 150-175. Total solids, 58-62%.
X-679 GR-S	Butadiene/styrene charge ratio 75/25, polymerized at 122° F.; activated with Nitrazole CF. Emulsified with sodium rosin acid soap and sodium fatty acid soap. Shortstopped with sodium or potassium dimethyl dithiocarbamate and sulfur as either polysulfide or polyamine. Stabilized with 1.25% (on the rubber) of a standard antioxidant such as PBNA. Mooney viscosity (ML-4 at 212° F.), 52 ±6.
X-680 GR-S	A masterbatch of 100 parts X-580 GR-S latex and 55 parts Spheron 6; the carbex to be dispersed in an Entoleter.
X-681 GR-S	A masterbatch of 100 parts X-580 GR-S latex and 55 parts Spheron 6.
X-682 GR-S	A masterbatch of 100 parts of high Mooney X-620 GR-S and 40 parts of Circosol-2XH. Butadiene/styrene charge ratio 71/29, polymerized at 41° F. Activated with PMHP or equivalent; emulsified with potassium fatty acid soap. Shortstopped with sodium or potassium dimethyl dithiocarbamate and sulfur as either sodium polysulfide or TEPA. Stabilized with 1.25% ELGI (on the rubber). Glue-acid coagulation. Mooney viscosity of masterbatch (ML-4 at 212° F.), 60 ±7.
X-683 GR-S Latex	Butadiene/styrene charge ratio 70/30, polmerized at 50° F. Activated with PMHP or equivalent; emulsified with Neo-Fat M-242; shortstopped with sodium or potassium dimethyl dithiocarbamate. Total solids, 47-49.9%. Mooney viscosity of the contained polymer (ML-4 at 212° F.) 140 minimum.
X-684 GR-S Latex	Same as X-683 GR-S Latex, except total solids of 60-63%.
X-685 GR-S Latex	Same as X-644 GR-S-AC, except stabilized with 1.25% ELGI (on the rubber).
X-686 GR-S	Oil black-rubber masterbatch similar to X-629 GR-S, except that the carbon black is Aromex instead of Philblack O.
X-687 GR-S	Same as X-580 GR-S, except that the carbon black is Continex HAF instead of Philback O.
X-688 GR-S	Same as X-598 GR-S, except that the carbon black is Continex HAF instead of Philblack O.
X-689 GR-S	Butadiene/vinyl toluene charge ratio 75/25 polymerized at 41° F.; activated with PMHP or equivalent; emulsified with rosin soap L.M. 2.19.0.3. Shortstopped with sodium or potassium dimethyl dithiocarbamate and either sulfur as polysulfide or polyamine H or equivalent. Stabilized with 1.25% BLE (or equivalent) on the rubber. Mooney viscosity (ML-4 at 212° F.), 50 ±7.
X-690 GR-S	A masterbatch of 60 parts Dutrex 20 and 100 parts of a higher Mooney viscosity polymer otherwise identical with the base polymer in X-663 GR-S, except that the shortstop is sodium or potassium dimethyl dithiocarbamate and sulfur as sodium polysulfide or equivalent.

Celogen—Blowing Agent

CELOGEN, a new chemical blowing agent for the manufacture of both rubber and plastic sponge products, has been developed by Naugatuck Chemical Division, United States Rubber Co. Chemically, the new material is p,p' oxybis (benzene sulfonyl hydrazibe) and is a stable white powder at normal temperatures that decomposes at temperatures above 135° C. with the liberation of nitrogen gas. Because of its high decomposition point, the material can be added to relatively hot stocks on a mill without danger of a premature blow.

Celogen can be used with either natural or synthetic rubber, a variety of plastics, and with rubber-plastic blends. Sponge rubber made with the chemical has a fine, uniform cell structure and can be made in either open-pore or closed-pore types. The sponge can be non-staining, non-discoloring, and odorless. Now in commercial production, Celogen is particularly suited to the manufacture of vinyl plastic sponge; the resulting product, it is claimed, is unusually buoyant, weighing six to eight pounds per cubic foot, flameproof, and ranging in hardness from rigid to soft.

New High Polymer Research Instrument

A RECORDING photoelectric interferometer, recently developed by R. N. Work of the National Bureau of Standards, greatly simplifies the determination of transition temperatures in natural and synthetic rubbers and other high polymers. The fully automatic instrument[1] observes and plots the varying length of a polymeric sample against temperature over the range from —185 to +185° C. Transition temperatures are then readily obtained as discontinuities in the plotted curve or in its slope.

The visual interferometric previously used the continuous attention of an operator. Various photographic methods have also been tried, but all involved the processing of photographic film and manual plotting of data. The new photoelectric interferometer eliminates all manual operations and presents the plotted data on a record chart in a form suitable for immediate determination of transition temperatures and the estimation of expansion coefficients.

The NBS instrument is particularly well adapted to survey work where transitions must be found rapidly in a large number of materials. The data can be processed with a minimum of effort, and a precision of ±0.5% or better can be realized in the finding of transition points. The values for coefficients of expansion thus obtained for rubber-like materials are reproducible to at least ±5%.

[1] "A Photoelectric Recording Interferometer for Measurement of Dimensional Changes." Richard N. Work, *J. Research NBS*, 47, 80 (1951), RP 2230.

New Latex Thickeners

POLYCO 296BT and Polyco 296N acrylic thickeners, aqueous solutions of sodium polyacrylate, have been announced by American Polymer Corp., Peabody, Mass. These materials are water-soluble anionic colloids furnished as straw-colored, homogeneous solutions containing 15% solids content. Polyco 296BT is a high-viscosity grade; while Polyco 296N is a medium-viscosity grade. The new products are recommended as stabilizers, protective colloids, and thickeners for natural and synthetic rubber and resin latices. Acting as non-creaming thickeners for latex, the resins are fully saturated; will not yellow, embrittle, or oxidize; and are stable at alkaline and mildly acid pHs.

Rhode Island Club Elects

APPROXIMATELY 140 members and guests of the Rhode Island Rubber Club attended its fall dinner-meeting, November 15, at the Metacomet Golf Club, East Providence, R. I. Speaker of the evening was G. H. Stempel, The General Tire & Rubber Co., who discussed "The Practical Utilization of High Mooney Viscosity Synthetic Rubber." Dr. Stempel's talk was based on the articles that appeared in our June-August issues and was similar to those talks given before the October 23 meeting of the Buffalo Rubber Group and the September 20 meeting of the Southern

(*Continued on page 348*)

NEWS of the MONTH

NPA Base-Period Rubber Allocation to Continue; New OPS Price Ceiling To Be Developed

Although no official announcement was made by late November, it was understood that the National Production Authority had abandoned its plan of September to allocate new rubber according to individual manufacturer's requests, at least as far as the first quarter of 1952 was concerned. Apparently the long consideration of altering the natural rubber stockpile objective and rate of accumulation has not resulted in any substantial reduction in either.

The Reconstruction Finance Corp. announced that, despite some possibility of an excess of GR-S synthetic rubber in 1952, it was going ahead with its plans for raising the production capacity from 760,000 long tons to 860,000 long tons a year. The first increase in GR-S production resulting from this expansion program will be felt in December.

The General Services Administration has adopted a plan to return the purchase and distribution of natural latex to private industry, but since this plan depends on liquidation of existing government stocks, a free market in latex is not expected before the second quarter of 1952. The #1 RSS natural rubber price will continue at 52¢ a pound until January 1, 1952. A free market in crude natural rubber may be achieved by the third quarter of 1952, according to one industry source.

Ceiling prices for most rubber products, except new tires and tubes, will be established under new regulations issued in November by the Office of Price Stabilization, which apply the so-called Capehart amendment to manufacturers covered by CPR 22. The new regulations become effective December 19, in most cases.

A report by the National Safety Council on special tires for winter driving has caused some comment in the tire industry.

Appointment of a qualified committee to draw up a 10-year plan for rehabilitation and expansion of the nation's antiquated highway system was recommended by James J. Newman, vice president of The B. F. Goodrich Co.

Approval by the Wage Stabilization Board on the 13¢-an-hour wage increase recently granted Big Four rubber workers was announced November 29.

Washington Report

By

ARTHUR J. KRAFT

NPA Early 1952 Plans

NPA was reported in early November to have decided to continue the present method of allocating new rubber through the first quarter of 1952. An expected announcement to this effect, however, did not materialize.

The decision was to have come on whether the agency would move ahead with its tentative plan of allocating according to individual manufacturer's requests beginning January 1. The determination of whether to put this plan into effect hinged on the industry's response to a NPA questionnaire in which each consumer was asked to estimate his first-quarter requirements of natural rubber and of synthetic rubber.

According to an agency source, replies to the questionnaire indicated that the industry, collectively, plans to use more natural rubber than will be available for consumption in the first 1952 quarter. For this reason the plan was reportedly abandoned, or at least deferred to a later quarter. Industry's estimate of its requirements for GR-S was reported in harmony with the prospective supply of this material.

Although no figures have been disclosed on the amount of natural rubber available for consumption in the coming quarter, it is fair to assume that NPA had in mind slightly more than 30,000 tons a month when it announced its tentative plan in late September. Whether industry's indicated requests exceeded this tonnage, or whether government stockpile determinations, made since that date, are responsible for the reported decision to continue with the current base-period allocation method could not be determined.

Thus far it seems evident that the long consideration of altering the natural rubber stockpile objective and rate of accumulation has not resulted in any substantial reduction in either. GSA has been able in recent weeks to increase its purchases, but mainly in the secondary grades.

Judging from their public statements, many tire industry leaders are looking for NPA to permit manufacture of a second line of passenger-car tires in the coming quarter and also, perhaps simultaneously, but more likely later in the season, to lift the current limitation holding passenger-car tire output to 90% of base-period production.

On another front, NPA in late October heard from its rubber processing machinery advisory committee that production of this machinery is declining steadily, threatening to interfere with production of airplane and combat vehicle tires for the military. NPA officials reported that improvement in the supply of aluminum for molds should come in the latter part of next year, although current supply may be eased somewhat by halting aluminum stockpiling to make more aluminum available for consumption.

NPA Personnel Changes

Osgood V. Tracy, chemical products department manager for Esso Standard Oil Co., who joined the NPA in October as deputy director of the Chemicals Division, was elevated to director of that division during November.

Tracy replaced Kenneth Klipstein, Calco Division, American Cyanamid Co., executive, and Klipstein, instead of returning to Cyanamid, as was reported last month, was elevated to deputy director of the Rubber, Chemicals & Forest Products Bureau of the NPA.

Spencer RFC Rubber Head

RFC Administrator W. Stuart Symington announced the appointment, effective November 26, of Leland E. Spencer, vice president of Kelly-Springfield Tire Co., and since January, 1951, director of the NPA Rubber Division, as chief of the Synthetic Rubber Division, RFC.

Spencer replaces Gerald B. Hadlock, who resigned as executive director of the Synthetic Rubber Division, RFC, during October. Hadlock was supposed to continue as an adviser on synthetic rubber operations.

E. D. Kelly, deputy director of the NPA's Rubber Division, was moved up to the position of director, following Spencer's transfer to the RFC.

RFC Rubber Activities

Despite some talk to the effect that rubber manufacturers soon will be surfeited with more than ample supplies of GR-S, RFC reported last month that it intends to go ahead with its 100,000-ton-a-year GR-S expansion program.

In a press release November 7, RFC Administrator Symington said December output of GR-S "will be somewhat above" the current annual rate of 760,000 long tons. December production, he noted, will reflect "the first increase as a result of the program of expanding production to reach an annual rate of 860,000 tons by mid-1952."

RFC and other government sources, however, declined to state positively that production actually will be brought to this level should a surplus appear as the likely result. They left some room for conjecture that while the steps necessary to bring an additional 100,000 tons out of existing plants will be pressed, the agency might at the same time reduce production elsewhere, with the net effect of placing the GR-S production rate somewhere between 760,000 and 860,000 a year. This bridge, however, will be crossed when and if it is reached. At present the production goal is still 860,000 tons a year.

In the same release Symington noted that GR-S output was restored in November to the 760,000-ton per annum rate, recovering from "the bad fire at the Borger, Tex., butadiene plant in September."

He announced also that RFC has sufficient alcohol on hand or under commitment to meet requirements for the rubber program for the remainder of 1951 and for several months in 1952. For this reason, he added, RFC is at present making no further purchases or commitments for alcohol for the synthetic rubber program.

Symington put the total alcohol on hand or under commitment for alcohol-butadiene plants at more than 100 million gallons. This supply, he said, has been built up over a period of months from a variety of sources at an average price of about 67¢ a gallon f.o.b. RFC synthetic rubber plants.

GSA on Latex Buying

GSA said November 19 that it would

give up its exclusive purchasing authority over natural latex rubber "as soon as necessary details can be worked out."

Jess Larson, GSA Administrator, said no specific date could be set now because turning the purchasing power back to industry involved orderly liquidation of present stocks. The change-over was being accomplished with the full advice and consent of the importing industry, representing major producers and consumers of latex, Larson added.

An industry source, in commenting on the Larson announcement, said that GSA had finally adopted the liquidation plan suggested by the latex industry. Some purchase and import of latex will be necessary by the GSA through the first quarter of 1952 to balance out stocks, but a return to a free market on latex was predicted for the second quarter of 1952.

Although GSA has given no indication of when it will return the purchase and distribution of crude natural rubber to private industry, Larson stated again that the government wishes to get out of the rubber business as soon as possible. One estimate of when private buying of natural rubber may be permitted again is the third quarter of 1952.

The GSA 52¢-a-pound price for #1 RSS which has prevailed in recent months will be continued through December, it was learned late last month.

OPS Price Actions

Ceiling prices for most rubber products, except new tires and tubes, will be established under new regulations issued last month by OPS which apply the so-called Capehart amendment to manufacturers covered by Ceiling Price regulation 22.

These new regulations, under which most manufacturers must begin pricing on December 19, will apply to many rubber products covered by Supplementary Regulation 8 to CPR 22.

Tires and tubes are excluded from immediate coverage by a specific exemption applied to SR 10 to CPR 22, which postpones indefinitely the effective date of CPR 22 for new tires and tubes. The Capehart regulations issued in November put CPR 22 into effect December 19, but with important changes.

Generally, the revised CPR 22 requires that ceiling prices for manufactured goods allow for all cost increases or decreases in labor, materials, and overhead costs which occurred prior to last July 26. OPS may not roll back ceilings, however, below the January-February, 1951, level.

Price Stabilizer DiSalle has forecast that the new regulations will mean higher ceilings and, eventually, higher prices. Following through on the unit cost feature of the Capehart amendment, the regulations protect, up to last July 26, each manufacturer's pre-Korean profits, regardless of whether his production volume increased or decreased since the pre-Korean base period.

Individual manufacturers, dissatisfied with industry-wide price ceilings issued by OPS, are entitled to apply higher ceilings based on their own unit costs. The high-cost producer, therefore, may get a higher ceiling than others in the industry. Generally, OPS has determined ceilings—as with the cost adjustment factors of SR 8 on rubber goods—by striking the average costs for a number of producers.

For most manufacturers the new regulations are mandatory on December 19. Some, however, may price under the old provisions of CPR 22 on that date and apply the Capehart formula of the new regulations later. As with all ceiling price orders, the revised CPR 22 sets only the maximum prices at which goods may be sold. It does not prevent any manufacturer from selling at below those prices.

The new regulations differ from the old CPR 22 in several respects. They provide slightly different base periods; the old provisions of CPR allow any of the four calendar quarters from July 1, 1949, to June 30, 1950; while the new regulations allow either of the two first-half 1950 quarters or the January 1 to June 24, 1950, period.

The new regulations also provide several methods for figuring cost increase; whereas the old CPR 22 permitted only that cost increases be figured from the end of the base period selected.

Also, the July 26, 1951, cut-off date for labor and material costs supersedes the old cut-off dates of March 15, 1951, for labor costs and December 31, 1950, for most materials. Furthermore as noted, the new regulations permit manufacturers to take account of increases in their overhead costs, except those considered "unreasonable or excessive." Overhead costs were not included in the pre-Capehart regulations.

In the calculating of overhead costs, the regulations permit manufacturers to use their established methods, although their computations must be made on a basis of comparing costs incurred in the first half of 1951 with costs incurred in the first half of 1950. Where a manufacturer lacks the data to make complete unit overhead computations, he must relate any unallocated factory overhead to his production costs and any unallocated general overhead to his sales.

The agency was planning to follow the basic Capehart regulation to CPR 22 with several other regulations also applying the Capehart formula. These were to include a small business supplement to CPR 22, providing a simpler formula for manufacturers with net sales under $1 million; a revision to SR 2 to CPR 22, to allow application of the Capehart formula to GCPR prices instead of base-period prices; a general overriding regulation applying Capehart formula to manufacturers not covered by CPR 22, or the machinery (CPR 30) or service trades (CPR 34) regulations; another GPR for manufacturers not covered by CPR 22 or CPR 30, who have sales under $250,000 a year; and a few special regulations for the service trades.

In late October, OPS issued an amendment to CPR 64, ruling that truck, bus, and taxicab fleet operators whose tire mileage service contracts do not contain escalator clauses need not pay higher rates to their tire suppliers to offset higher costs of rubber, rayon, and cotton. The amendment requires, however, that new contracts contain escalator clauses adjusting tire mileage service rates to *decreases* in the cost of these materials. It permits, but does not require that the escalator clause likewise cover increases in these costs.

Recommendations that a tailored regulation be issued to cover their industry were made October 18 by members of the Rubber Chemicals Industry Advisory Committee at their first meeting with OPS officials. Committeemen indicated that a regulation would be satisfactory which employed industry-wide percentage cost adjustment factors, applicable to prices established under the GCPR, and which would cover new cost increases. The industry is confronted with rises in the cost of aniline and other raw materials.

Rubber chemicals are under CPR 22. Several manufacturers have reported ceilings under CPR 22, but have not put them into effect. Committeemen reported that CPR 22 would yield some rollbacks and some rollforwards, with the latter predominating.

Committeemen undertook to study the question of what chemical products should be included in the coverage of the suggested regulation and report to OPS. They discussed the type of information that OPS would need and said it would be made available to assist in preparing the regulation.

Members of the Rubber Chemicals IAC are A. I. Brandt, B. F. Goodrich Chemical

CALENDAR

Dec. 18.	**Washington Rubber Group. Christmas Party. Georgetown Hospitality Hall, Christian Heurich Brewery.**
Jan. 14-17.	**Plant Maintenance Show. Convention Hall, Philadelphia, Pa.**
Jan. 16.	**Washington Rubber Group. Potomac Electric Power Co. Auditorium, Washington, D. C.**
Jan. 16-18.	**Society of Plastics Engineers. National Technical Conference. Edgewater Beach Hotel, Chicago, Ill.**
Jan. 20-24.	**National Sporting Goods Assn. Convention and Show. Morrison Hotel, Chicago, Ill.**
Jan. 25.	**Philadelphia Rubber Group. Poor Richard Club, Philadelphia, Pa.**
Feb. 1.	**Akron Rubber Group. Mayflower Hotel, Akron, O.**
Feb. 5.	**The Los Angeles Rubber Group, Inc. Hotel Mayfair, Los Angeles, Calif.**
Feb. 7.	**Northern California Rubber Group.**
Feb. 8.	**Chicago Rubber Group. Program on Plant Safety & Material Handling.**
Feb. 16-24.	**National Sportsmen's & Vacation Show. Grand Central Palace, New York, N. Y.**
Feb. 20.	**Washington Rubber Group. New York Section, SPE. Hotel Gotham, New York, N. Y.**
Feb. 21-22.	**The Society of the Plastics Industry (Canada) Ltd. Tenth Annual Conference. Royal York Hotel, Toronto, Ont., Canada.**
Mar. 1-31.	**The 1952 Red Cross Fund Campaign.**
Mar. 3-7.	**American Society for Testing Materials. Spring Meeting and Committee Week. Statler Hotel, Cleveland, O.**
Mar. 4.	**The Los Angeles Rubber Group, Inc. Hotel Mayfair, Los Angeles, Calif.**
Mar. 6.	**Northern California Rubber Group.**
Mar. 11-14.	**The Society of the Plastics Industry, Inc. Fifth National Plastics Exposition. Convention Hall, Philadelphia, Pa.**
Mar. 12.	**Newark Section, SPE. Military Park Hotel, Newark, N. J.**
Mar. 19.	**New York Section, SPE. Hotel Gotham, New York, N. Y. Washington Rubber Group.**
Mar. 21.	**Chicago Rubber Group. Morrison Hotel, Chicago, Ill.**
Mar. 22-Apr. 6.	**Chicago International Trade Fair. Navy Pier, Chicago, Ill.**

Co.; E. R. Bridgwater, E. I. du Pont de Nemours & Co., Inc.; C. W. Christensen, Monsanto Chemical Co.; E. B. Curtis, R. T. Vanderbilt Co.; R. P. Dinsmore, Goodyear Tire & Rubber Co.; W. T. Hall, C. P. Hall Co.; G. R. Lawson, Sharples Chemicals, Inc.; A. R. Loosli, American Cyanamid Co.; and W. F. Tuley, United States Rubber Co.

An OPS proposal to establish dollars-and-cents ceilings on their products at current market levels was questioned by members of the Original Equipment Tire & Tube Subcommittee of the Tire & Tube Manufacturers Industry Advisory Committee at meeting with OPS officials in Washington on November 19.

Committeemen reported that original equipment tires and tubes are now selling below ceilings established under the GCPR. They said prices were reduced October 1, in anticipation of a further reduction in the government price of natural rubber which has not materialized.

They pointed out however, that they were confronted with actual and prospective wage increases and declared that their industry may need the spread between their present selling prices and the ceilings on original equipment tires and tubes to cushion any possible increase in the government price of rubber. They pointed out, further, that original equipment tires and tubes are sold on very narrow margins and said the action of the industry in voluntarily lowering prices on original equipment tires and tubes in October was evidence that it was not contributing to inflation.

Tire and tube manufacturers are at present under GCPR, having been exempted from CPR 22 by SR 10. This exemption, however, was made in anticipation that a tailored regulation would be written for the industry, and OPS undertook to sound out the industry representatives as to the type of regulation that would be most suitable.

The proposal to fix dollars-and-cents ceilings on original equipment tires and tubes at current market levels conforms with one of the alternatives provided in the Capehart Amendment — ceilings at market levels prevailing immediately before the issuance of the regulation.

The alternate possibility of making another cost study in the industry, to determine cost increases since pre-Korea on the basis of the Capehart formula, also was discussed.

NAITD Convention

One of the speakers at the convention of the National Association of Independent Tire Dealers in Washington, D. C., in late October was Leland E. Spencer, chief, Rubber Division, NPA. He stated that the nation is in pretty good shape as far as rubber and the rubber industry are concerned, but warned that the situation was subject to change without notice.

Present plans include keeping rubber under control as long as there exists the slightest danger to national security, he declared.

Spencer reported tire production at a high level, military orders for rubber goods being met on schedule, the stockpiling program proceeding nicely, and world rubber production on the rise. The rubber industry's biggest job is the rebuilding of inventories of finished products which he termed "dangerously low." This work must proceed with all possible speed, he said.

H. E. Humphreys, Jr., president and chairman of U. S. Rubber, another speaker, predicted that automobile tires of the future will be tougher than today's tires; yet the public will use more than at present.

Production will have to be boosted to keep pace with the growing population and increased use of motor vehicles, he said. The market for truck, bus, and farm tires will expand even more rapidly than for passenger tires during the next ten years, he added.

Humphreys scoffed at "prophets of doom" who think the increasing quality of tires will some day kill the replacement tire business.

"We have seen the market for tires increase in the face of advance in quality," he said. "The better we make tires, the more people use them. When we give the motorist more tire value for his money, it helps reduce the cost of car ownership and thereby puts more vehicles and tires on the road.

"It appears to me," he said, "that synthetic rubber and other synthetic materials have only begun to reveal their great promise as tire materials. Furthermore, our scientists are beginning to suggest that certain radically new techniques for building tires may one day give us a product of still higher quality with low production cost."

In addition to predicting a bright future for the tire segment of the rubber industry, he outlined an optimistic future for the industry as a whole. He said growth during the next 10 years will match or exceed the average for all industry. Pointing to new developments and greater diversification, he declared that "the growth possibilities in plastics, particularly, are astounding. Uses for many of them are multiplying so rapidly that production is doubling at the rate of once every three years or less."

Prominent rumor, current during the convention of the NAITD, was that the price discrimination suit brought by the Association against major tire manufacturers three years ago will soon be settled out of court.

Investigation indicated that a settlement may be concluded shortly, or further protracted negotiations between parties to the suit may continue for some months. A similar rumor made the rounds more than a year ago, about the time the Federal Trade Commission conducted hearings on a proposed quantity discount limitation order directed at tire manufacturers. The Commission has not spoken on the matter since its hearings.

The case involved was brought by NAITD in the U. S. District Court for the District of Columbia in 1948, charging the "Big Five" and The Rubber Manufacturers Association, Inc., with violation of the Robinson-Patman Act through alleged unlawful discriminations in the prices at which tires were sold to dealers.

The suit has not reached the trial stage, but remains on the court's calendar.

Small Business "Watchdog" Committee to Continue

The special rubber industry "watchdog" committee, appointed by the rubber subcommittee of the Senate Committee on Small Business, is to be continued, it was announced November 7.

Donald F. Pratt, vice president of Durkee-Atwood Co., chairman of the watchdog group, and Irving Eisbrouch, vice president of Dayton Rubber Co., a member of the group, issued the announcement following a visit to Washington. They said Senator Guy H. Gillette, D., Iowa, chairman of the rubber subcommittee of the Senate Small Business Committee, had advised them that the "watchdog" group would continue its work "in observing and advising in the field of rubber supply and distribution, where the group had functioned very effectively and been of real assistance."

According to Pratt and Eisbrouch, Senator Gillette stated that the "watchdog" group had been of help "both to small manufacturers of the industry and to the federal agencies concerned with the distribution of rubber." He added that it was his belief that there would be no cessation or interim suspension of the activities of either the rubber subcommittee or of the "watchdog" group.

Recent events which led to the resignation of Charles Shaver, chief counsel for the rubber subcommittee, led to some trade reports to the effect that this resignation meant the end of activity of both the subcommittee and of the "watchdog" group.

As a result, Pratt and Eisbrouch saw Senator Gillette in Washington, and the Senator advised them he expected Senator John J. Sparkman, D., Ala., chairman of the Senate Committee on Small Business, to appoint a successor to Shaver in "the very near future."

—A.J.K.

Other Industry News

NSC Tire Report

National Safety Council, Chicago, Ill., through its Committee on Winter Driving Hazards, recently released its 1951 Report, "What About Special Tires for Winter Driving," which has caused some comment in the rubber industry.

This committee on winter hazards is headed by Ralph A. Moyer, professor of civil engineering and research engineer, Institute of Transportation & Traffic Engineering, University of California, and the tire testing committee is headed by Prof. A. H. Easton, University of Illinois.

Some of the conclusions of the NSC report follow:

(1) While the performance of several specialized tires shows definite improvement over conventional tires for specific conditions, their overall improvement is not great enough to warrent less care or precaution when one is driving on slippery surfaces.

(2) Generally speaking, the detailed test results cited show that progress has been made toward producing safer tires for winter driving. It is hoped that these tests will stimulate further development of more effective specialized tires.

(3) On the basis of 1951 stopping and traction tests of six representative specialized tires on rear wheels only, the most significant finds on hard packed snow are that stopping distances with conventional tires on hard packed snow are about three times the normal stopping distance on dry concrete. With the best of the specialized tires, packed snow stopping distances are about 2½ times the dry concrete distance. With reinforced-type tire chains, stopping distances on packed snow are twice that on dry concrete.

(4) Natural rubber tires are about 8% superior to cold-type synthetic rubber in stopping on hard packed snow and 47% better in average traction ability.

(5) Winterized tires offer an average improvement of about 5% in stopping ability on hard packed snow, but their traction ability is 10% less than conventional-tread natural rubber tires.

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(6) Tires of the mud-snow type reduce stopping distances on hard packed snow an average of 13% compared to the conventional-tread natural rubber tires.

(7) Winterized mud-snow tires show an average improvement of 17% in stopping ability and 19% in traction ability on hard packed snow compared to conventional-tread natural rubber tires.

(8) Reinforced-type tire chains are far superior to the best of the tires tested both in stopping and traction ability on hard packed snow, showing an improvement over conventional-tread natural rubber tires of 39% in stopping ability and 273% in traction ability.

The Council report explains that in all tests each tire was compared against a standard 7.60x15 tire having a conventional rib-type tread. Since natural rubber was the only compound available at the time of the 1950 tests for tires of this size, this tire was used throughout both years' projects. Results with this natural rubber tire are considered standard, providing the baseline for comparative purposes.

Because of the current restrictions on the use of natural rubber, a secondary control tire, compound with cold-type synthetic rubber, was also used for comparative tests.

[Since no all-natural rubber tire was available even in 1950, the Council's reference to natural rubber tires used must have been to tires where the amount of natural rubber permitted was all used in the tread of the tire, and the secondary control tires must have been those with cold GR-S treads.—EDITOR.]

A spokesman of the rubber industry was quoted in the November 10 issue of the *Akron Beacon Journal* as saying that the Council's report was not a correct presentation of the facts with special reference to the superiority of natural over synthetic rubber, since experienced engineers of the industry have shown that a tire's tread design is the more important factor in determining stop-and-go ability of a tire on all driving surfaces.

L. A. McQueen, vice president in charge of sales, The General Tire & Rubber Co., also took issue with the Council's report in mid-November. He said that it was contrary to all industry findings and very definitely out of line with tests on General Tire's oil-enriched Polygen rubber.

"Our industry has records to show that synthetic rubber has met every test superbly. While the progress in the last five years has been almost miraculous, this is relatively little when compared with the advancement we now know will be made in the next five years", McQueen said.

"Not only will the synthetic rubber industry's developments enable us to make tires safer, free from punctures, but the tires will be streamlined in design that will make steering and stopping easier and safer, and also make the tire itself a thing of beauty," he added.

Road Committee Recommended

Appointment of a qualified committee to draw up a 10-year master plan for rehabilitation and expansion of "the nation's antiquated highway system" was recommended in November by James J. Newman, Goodrich vice presdient.

Newman urged that Congress assist in setting up a high level committee which would not only aid in the planning of highways, but also would report on the availability of such needed materials as steel and concrete.

"Everybody is talking about how deficient our roads are and the tremendous highway expansion that is needed, but there still remains the task of finding out how all this would be accomplished, and there are many facts and figures still lacking," Newman declared.

He quoted highway officials as estimating that 60 billion dollars would have to be spent on the country's network of roads to bring them up to 1951 traffic requirements. By comparison, he said, only $2.4 billion was spent last year.

"At that rate of expenditure, 25 years would be required to achieve an efficient highway system that could handle today's traffic," he said. "Our current problem is the construction as rapidly as possible of improved roads capable of handling the number of cars and trucks that will be in operation in 1955 and 1960.

"More than 48 million motor vehicles were registered in the United States at the end of 1950, an increase of 49.6% over 1940. In the same 10-year period the country's population grew only 14.5%. Motor vehicle registration approximating 65 millions is now forecast by 1960, indicating how materially present highway construction and replacement is being outdistanced," Newman explained.

"It would be relatively simple to replace today's obsolete highways in kind," he said, "but this would not alleviate the critical situation that now exists. The speed, weight and volume of present-day and future traffic calls for projected planning of super-highways by a capable and qualified committee—one that is completely free of politics. The line, grade, width and sight-distance requirements of divided parkways and limited-access super-highways in and adjacent to metropolitan urban areas will increase cost to a tremendous degree, but these expenditures must be met to keep our civilian economy and military preparedness program rolling at top speed," he concluded.

Labor News

Rubber company and labor union representatives met again with the Wage Stabilization Board in Washington in mid-November, and both argued for approval of that portion of the recent 13¢-an-hour wage increase agreed upon recently that required WSB approval.

The company and union representatives made the point that the rubber industry is a special case requiring immediate WSB action because of the parallel wage structure that exists between the rubber and the auto industries. The historic balance is being upset by the "escalator" clauses in the auto industry labor contracts, and the 13¢-an-hour wage increase would go a long way toward rectifying the situation, it was argued.

The WSB approved the 13¢ hourly wage increase agreement on November 29, with only minor changes.

In connection with management-labor relations in the rubber industry, *Monthly Labor Review* for October, 1951, a publication of the United States Department of Labor, Bureau of Labor Statistics, contains "Wage Chronology No. 19: Big Four Rubber Companies, Akron and Detroit Plants, 1937-51," which provides a very good record of general wage changes and related wage practices for these companies at the indicated plants for the period mentioned. The date and some details of the several wage increases granted during the period and the date and some details of related wage practices including such things as paid vacations, severance allowance, insurance plans, retirement plans, etc., are covered.

Strikes plagued plants of Goodrich, Goodyear, and Seiberling Rubber Co. in Akron during late October and early November, and also plants of Ohio Rubber Co. in Willoughby, O., and Conneautville, Pa.; Firestone Tire & Rubber Co. plants in Pottstown, Pa.; Republic Rubber Co., in Youngstown, O., and U. S. Rubber in Eau Claire, Wis.

The strikes were due to various causes; some were over wage rate changes, some over difficulties in agreeing on local contract provisions, and one, that at Ohio Rubber, over company-wide bargaining.

EAST

Expanding Operations

United States Rubber Co., Rockefeller Center, New York 20, N. Y., has greatly expanded its Koylon foam rubber production, by setting up an eastern plant for the manufacture of Koylon foam mattresses and cushioning. This plant, at Woonsocket, R. I., is now producing several hundred mattresses a day and sizable quantities of cushioning for domestic furniture and institutional use.

The eastern foam manufacturing unit was set up to lower shipping costs and speed up delivery throughout the East, a company spokesman said.

Foam production in the Woonsocket plant will enable U. S. Rubber, long behind on delivery, to give immediate delivery on Koylon foam mattresses, foundations, and cushioning. Previously all Koylon foam had been produced by the rubber company in its Mishawaka, Ind., plant.

The company also has opened a new yarn sales office in Chicago, Ill., at 300 W. Adams St. John H. Shaw, in charge of the sales office in Utica, N. Y., for the past two years, will direct the new office.

Combed and carded yarns will be sold from this office, and distribution of Ustex yarns, synthetic yarns, and duck fabrics will also be handled here.

Territory covered by the new office includes Illinois, Michigan, Indiana, Ohio, Wisconsin, and Minnesota.

United States Rubber Export Co., Ltd., a subsidiary of U. S. Rubber, has leased the entire 20th, 21st, and 22nd floors of the new 32-story Chrysler Building East, amounting to a total area of more than 22,000 square feet. Headquarters of the parent company will remain in Rockefeller Center, but more than 200 employes of the export division will move to the new building in the early spring.

The output of the Port Neches, Tex., synthetic rubber plant, operated for Synthetic Rubber Division, RFC, by Naugatuck Chemical Division, has been increased by use of stainless steel conveyer belts to replace black iron as part of the plant modernization program. Of particular importance was the installation of eight new stainless-steel dryer flights for conveying the wet crude rubber through the drying ovens. These conveyers each consist of 173 hinged flights or sections; the sections are about 12 inches long and made of perforated 16-gage Type 316 stainless steel. These conveyers have elim-

inated the rubber contamination problems previously encountered with the black iron conveyers. The stainless-steel flights show less adherence of the rubber particles, with less plugging of the perforations, yet easily withstand the mechanical flexings inherent in the conveyer.

U. S. Rubber Appointments

J. E. Hofmann has been named superintendent of the North Bergen plant. He first joined the rubber company on July 19, 1920, as a clerk in the comptroller's department, general offices. Since then he has served as accountant in the footwear division, Naugatuck; accountant in the comptroller's office, New York; manager of the crude rubber and cord accounting section of the treasurer's office, New York; assistant manager of statistics section of the treasurer's department, New York; and acting superintendent of the North Bergen plant.

Thomas R. Grimes has been appointed sales manager of U. S. Royalite plastic products, and William M. Coy, sales manager of U. S. Chemical Sponge and Carpet Cushion.

Mr. Grimes, since February, 1949, sales manager of U. S. Chemical Sponge and Carpet Cushion, in his new capacity will be in charge of Royalite and Flotofoam sales. His headquarters will be in the company's Chicago, Ill., plant at 2638 Pulaski Rd. Mr. Grimes started with U. S. Rubber in 1939 in the Koylon foam sales department. During World War II he was associated with the fuel cell department and in 1945 was assigned to foam sales.

Mr. Coy will make his headquarters in the footwear plant at Naugatuck, Conn., where chemical sponge and carpet sponge underlay are made. He joined the company in 1939 in the general products division, but was on military leave from October, 1941, to January, 1946. Since his return he has held various sales assignments and was appointed assistant sales manager of industrial Kem-Blo sponge in November, 1950.

H. Barden Allison has been appointed district sales manager of the Philadelphia branch, mechanical goods division, to succeed A. B. Means, who continues in the capacity of sales adviser. Mr. Allison joined U. S. Rubber in 1918 as a clerk in the mechanical goods branch in Philadelphia. He has since held several important selling posts and most recently was sales manager of the L. H. Gilmer division.

The Hajoca Corp., Philadelphia, manufacturer and wholesaler of plumbing and heating equipment, has been named a distributer of Uskon electrical radiant heating panels manufactured by U. S. Rubber. Hajoca, with 33 distributing branches in nine states along the eastern seaboard, becomes the first supplier to plumbing and heating contractors to handle this unique system of electrical radiant heat.

Uskon heating panels contain a heating unit made with rubber that will conduct electricity and operate on a principle similar to the rays of the sun. The panels are installed in the ceiling where heat rays radiate down through the atmosphere in a room warming everything they touch. The air in each room is vitally fresh, but not cold, and there are no drafts or cold spots.

Product Developments

Uscolite, a blend of rubber and plastic, is being used in two new textile industry applications developed by U. S. Rubber's mechanical goods division. The first application is a new yarn carrying quill said to wear two to three times longer than the wooden types now being used. The quill will not splinter, chip, or warp; is not affected by moisture; has no tendency to soften when run through conditioning agents; and has high surface friction for good yarn holding properties, it is also claimed. Made in blue, gray, and brown colors, the new quills are available in lengths of 8 and 8¾ inches.

The second development, a new spinning tube promising wear three times longer than that of conventional types, also holds up to 16% more yarn. In addition, the tube needs no metal ferrules, thus making possible a longer yarn package. Marketed under the trade name of Uscolite Tapered Warp Tube, this new product is available in standard sizes and in blue, gray, and brown colors.

A new finish and texture in its Elastic Naugahyde upholstery material has been announced by U. S. Rubber. Called burnished antique, the new grade is being made in 10 colors: chestnut, parchment, crimson, olive, gray, lime, sandalwood, yew green, coral, and citron. All colors are being produced in a 52-inch minimum width sheeting that stretches to 58 inches. By November 1 the company also expects to deliver the 10 colors of its royal antique grade and five colors of its royal morocco grade in the 52-inch width. Both of these materials are currently made only in a 47-inch width.

A new chemical, maleic hydrazide, which slows the growth of grass and may slash millions of dollars annually from the cost of mowing the roadsides and center islands of highways, has been developed by Naugatuck Chemical Division. Speaking before the thirty-seventh annual meeting of the Association of State Highway Officials on October 24 at Omaha, Neb., John W. Zukel, Naugatuck scientist, described tests conducted on Connecticut highways during the past year. Although further tests are still needed, treated test strips required only two mowings throughout the spring and summer, while untreated strips required 19 mowings during the same period.

Wolff to Washington

James S. Wolff has been appointed Washington, D. C., representative of B. F. Goodrich Chemical Co., Rose Bldg., Cleveland, O. He succeeds R. H. Williams, who has been assigned a new post. Wolff during the last war served five years in the Chemical Warfare Service. In 1946 he joined Goodrich Chemical and in 1947 was made a technical representative in Chicago.

Goodrich Chemical Product Uses

A huge vinyl plastic-lined sewer pipe nearly seven miles long and more than two yards in diameter is being installed in Orange County, Calif. The reinforced concrete pipe is lined with "T-Lock Amer-Plate," a plastic sheeting developed and manufactured by Amercoat Corp., South Gate, Calif. Goodrich Chemical's Geon polyvinyl chloride resin is used in these sheets which are softened and welded into a continuous lining by means of a hot air torch. Use of plastic-lined sewer pipes is expected to eliminate the expensive replacement costs resulting from the crumbling and wearing away of concrete pipes used to carry away corrosive industrial and septic sewage.

Expensive stainless steel nuts and bolts and special rubber-sealing gaskets used in corrosive chemical baths are being replaced by vinyl-encased low carbon nuts and bolts by Industrial Rayon Corp., Cleveland, O. Manufactured by Steere Enterprises, Akron, the plastic encased nuts and bolts are used in long, narrow tanks or baths employed in rayon manufacturing processes to hold corrosive chemicals at elevated temperatures. The properly preheated nuts and bolts are encased with plastic by dipping them into a vinyl plastisol made from Goodrich Chemical's Geon paste resin.

Plastic menu covers which cling to a window without the use of water, glue, or tape are being produced by Kirk Plastic Co., Los Angeles, Calif. Made from a semi-rigid Geon polyvinyl plastic, a product of Gooorich Chemical, the transparent covers are simply pressed to the glass surface, are readily removable, completely waterproof, resistant to perspiration and common household chemicals, and easily cleaned, it is claimed.

The ability of the plastic to cling to a polished surface such as glass is also utilized by Kirk in a transparent green sun visor, which is applied to the inner surface of an automobile windshied to reduce glare.

Hycar oil resistant rubber is used in a unique bearing seal manufactured by Victor Mfg. & Gasket Co. for the Timken-Detroit Axle Co. Used in heavy-duty truck axles, these inner-axle bearing seals are installed as a two-piece assembly, with sealing being accomplished axially rather than radially. The Hycar sealing element in the assembly is chemically bonded to a metal case with mechanical reinforcement and a flexing Hycar diaphragm. This construction makes possible a leakproof structure which, combined with a garter spring and metal top, gives excellent sealing efficiency with constant axial pressure.

For the first time in the history of the motion picture industry, each film producer can do his own recording directly by means of a magnetic stripe applied to the film, either before or after processing, and a prototype camera produced by RCA. Called Magna-Stripe and manufactured by Reeves Soundcraft Corp., New York, N. Y., the magnetically striped film is made by a patented process wherein a stripe of magnetic oxide is placed on the base side of standard black and white or color film. Hycar polyacrylic rubber, made by Goodrich Chemical, is used as the magnetic oxide pigment binder on the cellulose stripe.

Hycar PA is used for this application because of its good adhesion to cellulose acetate, its inherent stability, noninterference with electrical response, and because it does not permit the strip to become hard and brittle.

New Shell Sales Office

In a move designed to give better service to a rapidly expanding southern economy, Shell Chemical Corp., 50 W. 50th St., New York 20, N. Y., opened on November 1 a new sales office in Atlanta Ga.

M. W. Ellison, of the sales staff in New York, who joined the company in 1946, has been appointed manager of the new sales district. Aided by a staff of technically trained salesmen, he will administer Shell Chemical sales activities in Virginia, the Carolinas, Georgia, Florida, Alabama, and Tennessee.

Changes at Seiberling

Four organizational changes at Seiberling Rubber Co., Akron, O., were announced last month by L. M. Seiberling, vice president in charge of sales.

E. F. Gates, assistant to O. K. Feikert in accessories and repair materials sales, has been promoted to department manager and will also supervise treading and repair at the company's Akron sales and service center.

Feikert, who has been in charge of the service department as well as accessories and repair materials sales, continues as manager of the service department.

Carl Figenscher has transferred from manufacturers and government sales to the special products department, where he will act as sales representative and assist in development of new special products.

Fremont Wolcott is now in the mileage sales department after transferring from manufacturers and government sales.

George W. Robinson has shifted from merchandise distribution to advertising.

Gates joined the company in 1945 as a ThermoWeld engineer. He had previously been with The B. F. Goodrich Co., Goodyear Aircraft Corp., and Martin Tire Co.

Formerly with American Hard Rubber Co. and Goodrich, Figenscher came to Seiberling as a time study engineer. Later he worked in the mechanical goods sales department and was Washington representative for the company.

Wolcott, a Seiberling employe since 1939, worked in the tube room, mill room, tire repair department, and sales and service laboratory before shifting to manufacturers and government sales.

Employed in Seiberling's merchandise distribution department since 1941, Robinson was formerly with the Diamond Match Co.

Thirty Years for Seiberling

Seiberling Rubber Co. celebrated its thirtieth anniversary November 15 with a party cosponsored by the company and its 25-Year Club, which was held in the Mayflower Hotel, Akron.

Forty Seiberling employes who joined the company in its first three months of operation and are still on the payroll received special tribute during the ceremony. Included were the first two persons hired by F. A. Seiberling: Miss Anna N. Johnson, now secretary to President J. P. Seiberling, and Charles A. Reed, general sales manager. Miss Johnson started as secretary to F. A. Seiberling, and Reed was the firm's first salesman.

Also honored were George Greene, the man who built the first tire, now an elevator operator; William Wagner, who cured it, now a final finish department inspector; and the man who built the bag in which it was cured, Joseph E. Mackel, still in the water bag department.

The first tire made was on display, too, along with a new Safe-Aire passenger tire to offer an interesting comparison of changes made during the 30-year span.

The 40 honored received awards from President Seiberling, including a silver 30-year plate for the employes' 25-year award plaques and four weeks' paid vacation in the anniversary year.

One new member was inducted into the 25-Year Club by Seiberling and Ralph LaPorte, the club's president, who is also the firm's chief chemist. This member is Harry P. Schrank, vice president in charge of production, who joined Seiberling on November 15, 1926, as a tire designer.

Four employes included in the 30-year group traveled from outside the city to attend: Marcus Brown, president of Seiberling Rubber Co. of Canada, Ltd.; Earl L. Luthy, Chicago district manager; Carl A. Nelson, Minneapolis district office; and Nathan Rambo, Philadelphia district.

LaPorte announced that the 25-Year Club would have 228 members by the end of the year. Officers elected to head the organization in 1952 included: Joseph McKinley, president; Wilfred Andrew, vice president; Mrs. Gail Brodock, secretary; and C. B. Cain, treasurer.

Frank D. Andruss

Joins General Latex

General Latex & Chemical Corp., 666 Main St., Cambridge 39, Mass., has appointed Frank D. Andruss as general sales manager. Raymond E. Nelson continues as sales manager of the compound division, and Henry G. Brousseau, as technical sales manager.

Mr. Andruss comes to General Latex from the General Services Administration where he served as chief of the Latex Branch Rubber Division, Emergency Procurement Service. Except for service during World War II, he formerly was with Charles T. Wilson Co., Inc., as manager of the latex department. Mr. Andruss traveled to the natural rubber producing areas in the Far East during the Summer of 1950. This trip included stops in Ceylon, Malaya, Indonesia, French Indo-China, Holland, and England.

American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y., on November 16 announced a reduction of about 15 % in its price schedule for Aerosol OT-B, a recently introduced wetting agent. The material is a concentrated, quick-dissolving powder that can be shipped economically in non-returnable fiber drums, instead of the stainless-steel drums required for shipping liquid wetting agents. Because of shipping economies and an effectiveness comparable to the liquid grades, the new product is rapidly replacing the liquid for many applications in the textile, paint, rubber, plastics, dyestuff, radio, and other industries.

To Issue Preferred Stock

Stockholders of Diamond Alkali Co., Cleveland 14, O., on November 15 gave the "green light" to the company's plan for financing a long-range program of expansion and diversification through the issuance of preferred stock.

Meeting at noon in the company's headquarters in the Union Commerce Bldg., shareholders approved the directors' recommendation to increase capitalization from \$30,000,000 to \$55,000,000 by authorizing \$25,000,000 of preferred stock. Diamond has not had preferred stock for a number of years.

According to President Raymond F. Evans, there will be a public stock offering of not more than \$12,000,000 late this year or early in 1952 provided conditions of the money market are favorable. The stock will be convertible into common shares and will have \$100 par value.

Diamond earlier had announced a new expansion program designed to broaden operations in organic chemicals, particularly chlorine-based plastics, solvents, and insecticides. Plants at Painesville, O., and Houston, Tex.—two of the 14 Diamond operates throughout the country — will share in the expansion, which calls for construction of plants for the production of vinyl resins and improved insecticides at Houston, and perchlorethylene at Painesville, together with the necessary supporting facilities for chlorine production.

The company has also made application for listing its common stock on the New York Stock Exchange.

Holds Sales Conference

Rubbermaid manufacturers representatives met at Wooster, O., for a three-day sales convention beginning November 26, according to J. Robert S. Conybeare, general sales manager of Wooster Rubber Co. Meetings were held at the Wooster Country Club, and the opening address was made by James R. Caldwell, president.

Representatives reviewed 1952 merchandising, advertising, and distributing plans for the 60 Rubbermaid products for kitchen and bath that now account for the present sale of more than 80% of all rubber houseware products, according to the company.

Among the representatives scheduled to attend were: Charles Martin, Metropolitan New York; Howard and William Button, Pt. Pleasant, N. Y.; Clark Teel, Detroit; Charles A. Baldwin, Chicago; Robert P. Ingram, Kansas City; E. G. Corbitt, Decatur, Ga.; R. W. Marchand, Cuyahoga Falls, O.; John Martin, Philadelphia; C. T. Wheat, Memphis; George Mueller, Dallas; Harlan V. Meyer, Denver; A. H. Clark, Los Angeles; Ron Marston, Seattle; E. F. Robinson, Richmond; and J. C. Lee, Wooster. Rubbermaid Products, Inc., of Canada was represented by Walter W. Levy and D. A. James, Toronto, both of Diwalt Sales.

National Rubber Machinery Co., Akron 8, O., has opened an eastern sales office in the Raymond Commerce Bldg., 1180 Raymond Blvd., Newark, N. J. This office is under the direction of E. R. Coddington, recently appointed eastern sales manager, who has been associated with NRM for four years in the Akron general sales office.

Adds to Sales Staff

Sharples Chemicals, Inc., 123 S. Broad St., Philadelphia 9, Pa., has made the following additions to its sale department:

John W. Conyers, Jr., a recent graduate of the University of Michigan, has been appointed sales analyst in the Philadelphia office.

Edwin B. Davidge and Robert O. Rowe are new Sharples salesmen with headquarters in the New York regional office. Mr. Davidge was recently released from Army service, and Mr. Rowe is from the General Chemical Division of Allied Chemical & Dye Corp.

Bryant C. Ross has been appointed eastern rubber products manager for Sharples and will move his headquarters from New York to Philadelphia.

Offers Common Stock for Sharples Shares

Managements of Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7, and Sharples Chemicals announced November 8 that they have entered into an agreement whereby Pennsalt common stock will be offered in exchange for Sharples common stock at the rate of 5.15 shares of Pennsalt for one share of Sharples.

Officers of the two companies pointed out that combining the two businesses will further diversify both. Pennsalt has been engaged principally in the manufacture of inorganic chemicals, but in recent years has been extending its activities into the organic field. Sharples has specialized in synthetic organics, none of which are presently marketed by Pennsalt.

Among the principal raw materials required for Sharples' products are chlorine, caustic soda, and ammonia, which for many years have been purchased from Pennsalt by Sharples. It was to obtain these Pennsalt products that Sharples located its plant adjacent to Pennsalt's Wyandotte, Mich., works in 1932.

The industries served by Sharples are generally different from those served by Pennsalt. Sharples' principal products are synthetic organic chemicals which find outlets in various industries, including rubber, pharmaceuticals, petroleum, surface coatings, textile, and mining.

Pennsalt plans to issue up to 88,497 additional shares of common stock in exchange for all outstanding Sharples common stock at the agreed-upon rate. The new Pennsalt stock will be part of the 500,965 shares of Pennsalt common authorized, but not previously issued. If all outstanding Sharples stock is exchanged, Pennsalt's common stock outstanding will increase from 999,035 to 1,087,532. A registration statement relating to the offering of the new Pennsalt stock has been filed with the Securities & Exchange Commission.

American Resinous Chemicals Corp., Peabody, Mass., has announced that all Arwax Concentrates are available for prompt shipment as the result of a plant expansion to provide new production facilities. These products are concentrates of synthetic rubbers and resins in paraffin and micro-crystalline waxes and are used to improve the adhesion, flexibility, heat-sealing qualities, anti-blocking, and gloss properties of waxes. Butyl rubber, Vistanex, S-Polymer, and polyethylene Arwax Concentrates are currently offered.

White Star I. P. S.

Thomas D. Cabot

Cabot Holds Elections

Godfrey L. Cabot, Inc., 77 Franklin St., Boston 10, Mass., producer of carbon black, elected Thomas D. Cabot vice chairman of the board of directors and executive vice president, at the annual company meeting November 15. Godfrey L. Cabot was reelected president and elected chairman of the board; while Ralph Bradley was reelected treasurer.

Thomas Cabot withdrew from active direction in the affairs of the Cabot companies in the early part of the year to assume the duties of the Director for International Security Affairs in the office of the United States Department of State. He has now severed his official connections with the Federal Government and will return shortly to his Boston offices.

To Make Fiber Glass

Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh, Pa. will enter the fiber glass production field in the near future, according to Richard B. Tucker, executive vice president. Formation of a separate development and production unit to be known as the fiber glass division is now in process. Two types of fiber glass, strand fiber and super-fine fiber, will be made under a licensing agreement with Owens-Corning Fiberglas Corp.

The new division will be headed by J. Hervey Sherts as general manager. Mr. Sherts has been associated with the company since 1928 and has been director of the product development department since 1939.

Entry of the company into the fiber glass production field is a normal extension of the firm's natural activities, Mr. Tucker said. In the new field the company can utilize its 68 years of technological background in continuous glass mass production and product development experience. In addition, the firm's paint division makes Selectron, a plastic widely used in plastic-fiber glass laminates. Super-fine fiber glass has three principal uses, insulation, sound absorption, and flotation, in a wide variety of defense program requirements. Strand fibers are used in the form of yarn as electrical insulation for wires in motors; in the form of chopped strands for plastics reinforcement; and in the weaving of non-combustible fabrics.

Sales Changes at General

Promotions affecting nine key men in the nationwide sales organization of The General Tire & Rubber Co., Akron, O., were announced last month by J. E. Powers, trade sales manager.

William J. Shea, has been appointed to the manufacturers sales department, with headquarters in Detroit. With General since 1922, Shea served as manager of Denver and Akron branches prior to being named head of the Detroit branch in 1932.

J. A. Wilson, since 1949 St. Louis branch manager, succeeds Shea at Detroit. Wilson entered General's sales force at Memphis in 1944, becoming head of truck tire sales there in 1948.

Replacing Wilson is H. L. Davis, Akron branch truck tire sales manager, who started with the Akron branch as a salesman in 1946.

Houston Branch Manager H. L. Whitesell has been transferred to a special assignment on contractor and off-the-road tires in an area covering several southern states.

The sales trainer at the Atlanta branch, B. L. Crowe has taken over as manager of the Houston office. Crowe joined General as a salesman at Memphis in 1946.

Jack Bogle, since 1948 Richmond branch manager, has resigned to become the General distributer in Charlotte, N. C. Bogle became associated with General in 1945 as a salesman out of the Philadelphia branch and later transferred to the Richmond branch.

Lou F. Roberts, Memphis branch manager, is now Richmond branch manager. He began with the company in 1945 as a salesman and was made manager of the Memphis office four years later.

Otis D. Andrews, who joined the company in 1934 and became Atlanta branch truck tire sales manager in 1946, has been named Memphis branch manager.

J. G. Ragsdale, Los Angeles car dealer sales, has been appointed assistant manager of the branch there under L. L. Higbee, branch manager. Ragsdale became associated with the L. A. branch in 1948 as a salesman.

To Help Jim Thorpe

The national sales organization of The General Tire & Rubber Co., holding its annual convention in Akron, O., on November 14, provided financial assistance to Jim Thorpe, the great Indian athletic hero, announced as being seriously ill in Philadelphia, Pa. An emissary of the sales organization was sent to make arrangements to care for Thorpe. Company officials announced that this was not a corporation project; the funds were raised by the men themselves in a spontaneous gesture. Thorpe played with the Akron team of the International League back in 1921 and on several occasions played against the General Industrial team of that day.

Arthur D. Little, Inc., consulting research and engineering organization, 30 Memorial Dr., Cambridge 42, Mass., recently opened an office at Edificio Internacional 963, Reforma 1, Mexico 1, D. F., Mexico. In charge is Richard W. Plummer, formerly vice president of E. R. Squibb & Sons de Mexico and prior to that with the United States Office of Rubber Reserve.

Gives Safety Award

E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del., has announced that its top safety honor, the Board of Directors' Award, was given for the fifth consecutive time to the rubber laboratory at Deepwater Point, N. J. During the entire 22 years of its operation, the laboratory has never had a lost-time injury. The laboratory currently employs 100 people and has rolled up some 2,500,000 injury-free man-hours. According to National Safety Council statistics, the national average for chemical laboratories is two lost-time injuries per million man-hours.

Reorganizes Sales Activities

All sales activities of the company's organic chemicals department on December 1 were brought under one general director, Douglas C. Newman. Miles A. Dahlen became director of sales, dyestuffs division; and Gordon M. Markle, director of sales, fine chemicals division. H. J. Swezey is now director of sales of the export division, and J. Preston Wills, manager of export sales. The export business of the entire department is now put in one sales division for the first time.

Mr. Newman joined du Pont in 1918 as a textile colorist in the technical laboratory at Deepwater Point; became a technical demonstrator in 1921; the next year was transferred to the Providence, R. I., office of the dyestuffs division as salesman and demonstrator; and was made assistant manager of the Charlotte, N. C., office in 1927, manager in 1943; sales manager of the southern district at Charlotte in 1946, and sales director of the dyestuffs division in Wilmington in June, 1950.

Dr. Dahlen began with du Pont in 1928 as a research chemist at the Jackson Laboratory at Deepwater Point, becoming a division head in 1932. He was transferred in 1938 to the organic chemicals department's technical laboratory as assistant laboratory director; in 1946, was appointed assistant director of domestic sales of the dyestuffs division and in 1949, director of sales of the fine chemicals division.

Mr. Markle, who joined the company in 1922, was assigned to laboratory work in the technical laboratory and in 1923 was sent to Chicago, where a year later he became a dyestuffs salesman and in 1944, assistant sales manager of the Chicago office. In 1949 he came to Wilmington as a section manager in the dyestuffs sales division and was made assistant sales manager, domestic dye sales, in February, 1951.

Mr. Swezey started with du Pont in 1919, as a sales correspondent with the chemical products division at Wilmington; was transferred to the dyestuffs division and spent 1823-1929 in sales work in China. He returned to Wilmington in 1929 as export sales manager of the division and served successively as assistant director of sales of the organic chemicals department (1937); vice president of Bayer-Semesan Co., Inc., then a du Pont affiliate (1939); director of sales, intermediates, and exports (1940), with this title changed in 1948 to manager of export sales.

Mr. Willis first served the company, in 1917; as chief chemist of the high explosives laboratory, Deepwater Point. At the end of World War I he was appointed chief chemist of the dyestuffs intermediates division at the Chambers Works and transferred to the New York sales office of the organic chemicals department in 1920 as a correspondent. From 1924 to 1927 he was assistant manager of the Bombay, India, sales office. He returned to Wilmington in 1927 in the organic chemicals department in export sales and most recently was assistant export sales manager.

Goodrich Developments

The B. F. Goodrich Co., Akron, O., has developed a new tire for tractors and combines used in rice farming, which is said to keep equipment from bogging down in either sticky mud or sandy soil. Called the Power Curve rice field tire, the new high flotation tire features open center tread and slanted-nose cleats. The open center tread provides the flexibility needed for effective self-cleaning action; while the slanted-nose cleats bite into the soil and compress the sand or mud to give firmer footing. As the cleats release from the earth, the slanted nose helps clean the tread since the angled surfaces provide no niches for mud or straw. The design of the tire assures full traction across the width of the tread. Each cleat is extra-high at the shoulder to bite deeper and is braced by its curve to stand rigid. The tread is symmetrically designed for smooth riding when the equipment travels over road surfaces.

A new method of splicing steel cable conveyer belting, developed and patented by Goodrich, places all cables under equal tension during vulcanization so that each cable carries its share of the load in the finished splice. The new method also permits the straightest possible splice, resulting in belts that track straight and true for trouble-free operation. Laboratory stress-strain tests have shown that the splice is as strong as the belt itself. To make the splice, the cable ends are cut in a staggered pattern. Small tubular connectors are placed over the butted ends, and the connectors are given a light crimping. The partially made splice is then stressed to even the lengths of cables, and the connectors are given a final crimping to lock them to the cables. The rubber and fabric removed for the splice is then rebuilt around the cables, and the splice cured under tension with a conventional vulcanizer. The tensioned splice can be made in the field as well as at the factory; the only special tools required are a crimping device and a scraper for removing rubber from the cables.

Rubber tank tracks are now rolling off the production lines at Goodrich's new track division. The first shipment of tracks for the M-24 light tank has been sent to the ordnance depot for overseas transportation. Goodrich is now working on contracts to supply replacement tracks for the Patton, Sherman, and Pershing tanks, as well as for high-speed cargo carriers and gun motor carriages.

Personnel Changes

Carl J. Tsaloff has been named production manager of the aeronautical division. He comes to his new post after serving as manager of the company's Cadillac, Mich., plant since last January. Succeeding him there is T. George Hatch.

Tsaloff has been with Goodrich for 18 years, starting as a factory employe and becoming a floor and shift foreman while attending Akron University. He was a production and technical staff man in the Lone Star ordnance plant at Texarkana, Tex., which the company operated for the government during the war years. Returning to Akron, he was made a conference leader in the educational program and then night shift superintendent at Plant 4, before he went to Cadillac.

Hatch joined the company 29 years ago as a factory employe in the industrial products division, where he became a foreman in 1936. A year later he was transferred to the Los Angeles, Calif., plant, where he remained until 1942, when he was appointed a foreman at Plant 4 in Akron. He had been a general foreman of several departments making extruded goods for the last five years.

Clarence W. Wacker, senior sales representative of the automotive, aviation, and government division in the Detroit district since 1942, has retired after 40 years with Goodrich. He has been succeeded by Colin M. Stewart, who has been with the company since 1934.

Stewart started in the truck tire sales department and was truck representative in the Cincinnati district several years before becoming manager of the Cleveland office of the automotive, aviation and government division in 1942. In 1945 he was named general manager of a manufacturing firm in Cuba with which Goodrich is associated and held that post until this year, when he was transferred to Detroit.

Acme Advances Howell

Albert M. Kahn, president of Acme-Hamilton Mfg. Corp., announced last month that Leaston J. Howell had been named executive vice president and general manager. The company operates two plants in Trenton, N. J., Hamilton, founded in 1870, and Acme, founded in 1902. Both manufacture mechanical rubber goods.

Mr. Howell, associated with Hamilton for 34 years, was made vice president in charge of operations for the two plants in 1949.

Announcement was also made that Harry C. Burger, vice president of the Acme division, will succeed Howell as vice president in charge of production for both plants. Ervin W. South, director of sales at Hamilton for years, will become vice president in charge of sales of both divisions. Norman J. Cyphers was named vice president and technical director for both plants, and J. Vincent Carlin will be general sales manager of the Acme company.

South and Howell will continue as member of the board of directors. All other officers and directors were reelected.

Acme-Hamilton has sales and service branches in Los Angeles, San Francisco, Chicago and New York.

The Timken Roller Bearing Co., Canton 6, O., has appointed Sherman R. Lyle, since 1946 a sales engineer at its Cleveland office, to the position of district manager of the steel and tube division, Northern Pennsylvania and New York State District, with headquarters in Buffalo. Lyle has been with Timken since 1940.

Robert E. Cook, field engineer with Timken's Cleveland office, has been named sales engineer of the steel and tube division of that office. Cook, formerly representing the graphitic tool steel line will, in his new capacity, represent all products of the steel and tube division of the company, which he had joined in 1939.

Increasing Facilities

More than 300 persons attended the recent opening of the new Milwaukee, Wis., district office and general factory warehouse building of the Goodyear Tire & Rubber Co., Akron, O.

E. J. Thomas, company president, gave a short talk following a buffet luncheon for friends and guests. Included among the representatives from the company's home offices in Akron were Victor Holt, Jr., vice president of tire sales; Howard E. Ammerman, manager, service department; and A. Jae Sears, dealer department; also J. T. Callaway, assistant to vice president, Chicago; R. W. Fitzgerald, northcentral division manager; E. C. Flinn, Milwaukee district manager; and E. E. Lutwack, former Milwaukee district manager, recently made assistant manager of trade relations at Akron.

The one-story brick structure, at 3860 N. Third St., replaces the former warehouse building at 1570 S. First St. and former district office building at 625 Milwaukee St. Occupying 38,000 square feet, 33,000 of which will be for storage purposes, the modern building will handle tires, mechanical goods, car and home merchandise, and other products.

Plans for a large addition to the Goodyear plant at Gadsden, Ala., have advanced to the point where applications for material and equipment priorities have been made to proper authorities in Washington, according to A. C. Michaels, the plant's resident manager.

Whether or not the plans will be finalized now depends upon what action the government takes on these applications, Michaels explained.

If restricted materials, particularly steel, become available, the existing plant will be enlarged by 270,000 square feet of floor space, and the production of large military airplane tires and truck tires will be substantially expanded. The appeal for material permits is based upon the importance of these products to the national defense program.

Construction plans have been completed, and appropriations have been made by Goodyear for the project, Michaels stated. Construction time normally would be something in excess of six months if essential materials and equipment are available.

An increase in employment at the Gadsden plant of between 600 and 800 would be provided by the expansion program.

It is contemplated that the new addition will be placed at the west side of the existing plant buildings and would bring the plant's total floor space up to two million square feet. This would make the Gadsden plant the second largest in the Goodyear list, second only to the home plant in Akron.

Goodyear built the original Gadsden plant in 1929 and has since enlarged it substantially. Tires and tubes, soles and heels, reclaim and camelback for tire retreading are produced here. Current employment is approximately 3,000.

Construction of what is belived to be the largest single industrial warehouse in the South has been started at Gadsden by Goodyear. Preliminary grading has already been finished, and footings have been partially poured for the one-story structure which will be 400 feet wide and 1,000 feet in length when completed in August, 1952.

Facilities for simultaneously loading or unloading 16 railroad cars and 20 trucks will be provided by the warehouse which embraces 16 acres of land. The warehouse alone covers nine and two-tenths acres, with the remaining space to be used for transportation and expansion purposes. This warehouse is about a mile from the Gadsden factory.

Approximately 100 employes will be needed to operate and maintain the factory field warehouse, which will serve the southeast part of the country. Finished products, including tires, tubes, mechanical goods, and car and home merchandise will be handled.

Goodyear's chemical division announced that supplies of Pliolite S-5 for the paint industry will be increased by mid-December. Herman R. Thies, division manager, said that increased quantities of unmilled material would be available in December, while output of milled resins and pigmented base would rise in January. Increased allocations on this styrene-butadiene copolymer are made possible by additional production facilities and an increase in the supply of raw materials, Thies stated.

Transfer of Personnel

Personnel changes involving six posts within the Goodyear organization also were announced last month.

First of the shifts affects the Gadsden plant, with Personnel Manager Thomas S. Mick named to the new position of assistant manager of sales and office personnel in Akron, reporting to C. R. Langdon, manager of the department. T. G. Plumb continues his present activities in connection with all field personnel work, both wholesale and retail.

Mick is replaced at Gadsden by E. G. Lytle, assistant manager of factory personnel at the Akron plant, which post goes to H. C. Hilliard, assistant to the director of personnel for the company, F. J. Carter.

C. F. Pinkston, manager of the Plant 1 wage efficiency department in Akron, has been elevated to Hilliard's former position.

Succeeding Pinkston is T. W. Johnson, manager of the Plant 2 labor department.

V. H. Brommelhaus, of the wage efficiency department at Plant 2, takes over Johnson's position.

The Bicycle Institute of America recently paid tribute to P. W. Litchfield, Goodyear board chairman, for more than a half-century of work in the development and production of bicycle tires. In special ceremonies at Mr. Litchfield's office in Akron, H. Clyde Brokaw, Institute president and head of Shelby Cycle Co., presented the Goodyear executive with a membership plaque and pin of the Institute's 50-year club.

New Products Reported

A non-leather shoe made entirely of Neolite was introduced by Goodyear at the National Shoe Fair which opened in Chicago, Ill., October 29. According to R. S. Wilson, vice president in charge of sales, the exhibit marked the entry of Neolite as an uppers material in the shoe manufacturing field. Used extensively for shoe soles and inner soles since 1944, Neolite was recently brought out in sheet form for fabrication by the luggage and leather goods industries. The all-Neolite shoe was featured in women's casual and style lines; while men's shoes utilized Neolite for all parts except the leather vamp. New finishing techniques permit the perfect matching of Neolite uppers material with leather or nylon mesh, as used in perforated shoes, Wilson stated. Use of Neolite in the tips, counters, and quarters of men's footwear, in addition to the soles and inner soles, gives a more durable shoe with improved flexibility and comfort.

A new "cellular" Neolite for soles and inner soles that is lighter and more flexible than the regular grade was also displayed at the Fair. The expanding application of Neolite in the shoe, luggage, and leather goods fields has necessitated a substantial increase in production facilities at Goodyear shoe products plants in Windsor, Vt., Gadsden, Ala., and New Bedford, Mass., Wilson revealed. Inner soles made of cellular Neolite are now being produced at a rate of 1,000,000 pairs a month. The new material is made in 20-gage thickness and up and comes in continuous lengths.

Goodyear's Pliotherm is being used in a novel application, a conductive rubber foot warmer designed to develop a temperature as high as 100° F. To be made in a wide range of colors, the foot warmer can be plugged into any convenient electrical outlet and can be moved without difficulty from place to place. The warmer is particularly useful for offices and shops with cold, drafty floors, but can also be used outdoors by persons whose work keeps them more or less in one spot. Other applications include press boxes, sentry boxes, and football fields beneath players' benches.

A 10,000-cubic-foot capacity caricature balloon built by Goodyear furnished one of the highligts of the R. H. Macy store's traditional Thanksgiving Day parade in New York. The huge figure, named the "Mighty Mouse," stands 33 feet high when inflated, 70 feet long, and has a stretch of 42 feet between each hand. The balloon is said to require some 35 gallons of paint to decorate.

N. J. Zinc Changes

Vice President C. Howard George has been elected a director of The New Jersey Zinc Co., 160 Front St., New York 38, N. Y., succeeding Wm. Woodward, who resigned.

Edward E. Schwegler has been elected comptroller of the company, succeeding Frederick H. Baxter, who continues, however, as vice president of the company.

Robert Lansing Campbell, of the Chicago staff of The New Jersey Zinc Sales Co., was transferred from the pigment sales to the metal sales division. Mr. Campbell entered the company upon his release from the Army on May 1, 1946. He has spent his full time since as a sales representative of the pigment sales division, calling on customers in Indiana, Iowa, and the Chicago city area. His new accounts will be buyers of Horse Head Special slab zinc, alloys, rolled zinc, and metal powders. His headquarters will continue at the company's Chicago sales office.

Stauffer Chemical Co., 420 Lexington Ave., New York 17, N. Y., has appointed Ernest G. Holmes, sales manager, agricultural chemicals, Houston sales district. Mr. Holmes was formerly manager of the Weslaco, Tex., branch. The Houston sales district embraces Mississippi, Louisiana, Arkansas, Texas, Oklahoma, and New Mexico.

Stauffer has completed a new laboratory adjacent to its plant at Chauncey, N. Y., where additional facilities for pilot-plant work are maintained. J. T. Bashour will be in charge of the laboratory, which has 16 lab rooms and offices.

Awards to Nellen, Garvey

Arthur H. Nellen, vice president of Lee Tire & Rubber Corp., Conshohockton, Pa., and Benjamin S. Garvey, Jr., sales service laboratory manager of Sharples Chemicals, Inc., Philadelphia, Pa., were among the 12 industrialists from the Philadelphia area who received awards on November 14 from the Department of the Army for their contributions to the war effort in industrial intelligence. A Certificate of Appreciation signed by Frank Pace, Jr., Secretary of the Army, was presented to each man by Col. Edwin M. Sutherland, Chief of the Pennsylvania Military District, in a special ceremony at Franklin Institute.

Both Mr. Nellen and Dr. Garvey served with the Technical Industrial Intelligence Committee which worked closely with the Joint Chiefs of Staff near the end of the war. Mr. Nellen's other war duties included service with Rubber Reserve and the War Production Board. Dr. Garvey also served on various committees of the Rubber Reserve and the Office of the Rubber Director and since 1949 has been a consultant to the Research and Development Board of the Department of Defense.

G-E Transfers Men

K. Jerry Morray, of the chemical division, General Electric Co., Pittsfield, Mass., has been transferred to the silicone plant at Waterford, N. Y., as a headquarters' sales specialist. Formerly a silicone sales representative in the Cleveland, O., area, Mr. Morray started with G-E in January, 1949, as a silicone sales specialist to the rubber industry; he assumed his Cleveland assignment in November of that year. He had been with United States Rubber Co. and the Barrett Division of Allied Chemical & Dye Corp. prior to joining General Electric.

Milton C. Lauenstein, Jr., has been assigned to take over silicone sales duties in the Cleveland area. He started with the G-E chemical division for silicone indoctrination at the Waterford plant in April, 1951. He formerly had been with Norton Co. as refractories sales engineer.

Jerome T. Coe, also of the chemical division, has been appointed customer service supervisor for silicone products, with offices in Waterford. Mr. Coe, manufacturing engineer at GE's silicone plant in Waterford since last October, was previously in charge of the plant's process development section. He came to the company in 1942. Last year he was presented the company's Coffin Award for development work on an improved silicone manufacturing process.

Thiokol Corp., Trenton, N. J., through Sales Manager S. M. Martin, Jr., has announced that "Thiokol" TP-90B and TP-95 plasticizers have been in short supply for about two years. But now the company's suppliers of raw materials have expanded facilities so that they can give Thiokol adequate quantities of raw materials without ratings. Consequently Thiokol Corp. has expanded its facilities for making the plasticizers to the extent that it can now accept orders without ratings. While the supply at present is not overly abundant, Mr. Martin feels that his company can, without too much delay, fill orders for these plasticizers.

Firestone Notes

Rocket motors for aircraft rockets are now being mass produced in Akron, O., by The Firestone Tire & Rubber Co., according to an announcement by President Lee R. Jackson. Heavy machinery, ovens, chemical tanks, and conveyer equipment for the manufacture of the many thousands of rocket motors called for in the company's contract with the Navy Bureau of Ordnance are in operation in Plant III, Firestone's defense products division. Components of the rockets include a finely machined five-inch steel tube, a multiple-nozzle exhaust ring, war head, launching brackets, and tailpiece fins. Units manufactured by Firestone are shipped to Navy depots for propellant charging and attachment of the war heads.

Harvey S. Firestone, Jr., chairman and chief executive of the Firestone company, has agreed to serve as co-chairman of the Religious Organizations Committee for Brotherhood Week to be observed throughout the nation February 17-24, under the sponsorship of the National Conference of Christians and Jews.

Gurdon H. Smith has been appointed southern district sales representative for Velon sheetings for Firestone Plastics Co., Pottstown, Pa. Smith, formerly in charge of the New York area, is making his headquarters at the recently opened Firestone offices in High Point, N. C., in Spaces 42 and 43, Southern Furniture Exposition Bldg. Mr. Smith's new duties will involve the continued close cooperation with the Firestone distributer and sales agent for the Southern area, Phillips-Davis, Inc., also of High Point.

Stuart G. Keiller has been made manager, Velon filament sales, Firestone Plastics. Keiller, with Firestone the past six years in the development and sale of Velon yarns and filaments, is making his headquarters at the New York, N. Y., office of the company in Empire State Bldg.

New York Quartermaster Procurement Agency, 111 E. 16th St., New York 3, N. Y., recently awarded the following contracts for: *synthetic rubber-coated cotton sheeting,* 100,000 linear yards, $66,-750, to Hodgman Rubber Co., Framingham, Mass.; *GR-S 62,* $63,522.37, Firestone Tire & Rubber Co., Akron, O.; *Paracril,* $6,740.16, Naugatuck Chemical Division, United States Rubber Co., Naugatuck, Conn.; *Neoprene GN,* $7,119.-84, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Harold B. Morris has been appointed vice president in charge of operations, Amertex Mfg. Corp., 1407 Broadway, New York, N. Y., a subsidiary of Gerry Nufoam Products Corp., New York, manufacturer of latex foam products. Mr. Morris's former business connections include service with the Chemical Corps Engineering Agency, Army Chemical Center, Md.; technical director of Eagle Rubber Co., Inc., Ashland, O.; Killian Mfg. Co., Akron, O.; Firestone Tire & Rubber Co., Akron; Firestone Rubber & Latex Products Co., Fall River, Mass.; and New England technical sales manager of Naugatuck Chemical Division, United States Rubber Co., on latex and compounded latices.

Simultaneously with the announcement of this appointment came disclosure of various expansion plans of Amertex, which, when completed, will double the company's productive capacity.

WEST

Monsanto in Italy

Monsanto Chemical Co., St. Louis 4, Mo., has announced that integrated facilities for the production of polyvinyl chloride resins and compounds of its Ultron 300 type are under construction at Porto Marghera, Italy, by Societa Industria Chimica, an Italian firm in which Monsanto holds an interest. In making the announcement, Marshall E. Young, director of Monsanto's foreign department, disclosed that a chlorine-caustic plant employing De Nora mercury cells has already been put into operation. Acetylene for producing vinyl chloride monomer will be made from calcium carbide in a nearby plant in which Societa Edison, major power company of Italy, has an interest. The Societa Industria Chimica is also a subsidiary of Edison. The polymerization plant, also being built at Porto Marghera, will be the largest of its kind in Italy.

Personnel Advanced

Monsanto has elected F. A. Abbiati a vice president. He has been general manager of the plastics division since October, 1950. Upon graduation from the University of New Hampshire, Mr. Abbiati entered the company's Merrimac Division, where he remained until 1938, the time of his transfer to the plastics division at Springfield, Mass., as sales manager for Vuepak. In June, 1939, he became assistant general manager of sales in February, 1944, and general manager of sales. He was named assistant general manager of the division in May, 1947.

Wyllys Russell has been appointed New England sales representative for the plastics division, to succeed Wilbur G. Creelman, who retired after 43 years with Monsanto.

Mr. Russell joined the company in 1941 in the production department, in 1946 became a foreman in the Santodex department, and in 1947 was made shift superintendent of the production department.

National Motor Bearing Co., Inc., Redwood City, Calif., has appointed L. C. Cole, well-known advertising agency head, director of sales. When Park Q. Wray, vice president in charge of sales, retires December 1, Mr. Cole will have full charge of the firm's sales organization, including functional responsibility for sales of Arrowhead Rubber Co. at Downey and Long Beach, Calif.

Mr. Wray, however, will continue as a director of NMB and will serve it for an indefinite period as a sales and merchandising consultant. He was honored by his associates at a dinner on November 26.

Extruders, Inc., Culver City, Calif., has become an affiliate of Pioneer Rubber Mills, San Francisco 11, Calif. W. S. Towne, Pioneer president, has assumed the same office also at Extruders, Inc.; while J. C. Ballagh, the former president, will continue his interest in Extruders, Inc., as a director of the company. R. G.. Kress and J. H. Farber, vice president and factory manager and sales manager, respectively, at Extruders, have resigned to engage in other activities.

Promoted by 3M

Promotion of J. O. Hendricks to the newly created post of associate director of the Minnesota Mining & Mfg. Co. central research laboratories, St. Paul, Minn., was announced November 20 by H. N. Stephens, central research director, who also named Matthew W. Miller and H. M. Scholberg assistant directors.

Hendricks joined 3M in 1936 after receiving his doctorate at the University of Illinois. He became head of the firm's organic chemistry section in 1942 and a year later took charge of the colloid section. He was made an assistant director of the central research laboratories in 1947.

Miller, who also received his doctorate at Illinois, was in the army from 1942 to 1946 and after the war did scientific investigation work in Germany for the War Department. In 1947 he succeeded Hendricks as head of the organic section.

Scholberg started with 3M in 1944 and has headed the electro-chemical section since 1948. In his new position he will head the inorganic section and will develop a new physical chemistry section. Scholberg received his doctorate from the University of Chicago in 1938 and later did research work for Sherwin-Williams and American Can Co.

W. J. Voit Rubber Corp., Los Angeles, Calif., has announced that its XF9 rubber covered football was used in the October 13 Southeastern Conference game between Georgia Tech and Louisiana State University, won by the former 25-7. While this ball has already been adopted as "official" by many college, junior college, and high school leagues and conferences, this event marked the first appearance of anything other than the conventional leather football in a major college conference game. The reactions of both the Tech quarterback and coach to the rubber covered ball were enthusiastic; they claimed that the ball was easier to throw, catch, and handle errorlessly than the leather ball. Use of the ball in the Southeastern Conference will be considered by the rules committee at its December meeting.

Vegetable Oil Products Co., Inc., Vopcolene Division, Los Angeles, Calif., has appointed the following agents: B. E. Dougherty Co., to serve as national sales distributers for Vopcolene products to the rubber industry, maintaining a principal office at 1807 E. Olympic Blvd., Los Angeles 21, and branch offices in San Francisco, Akron, and other important consuming centers; Lotte Chemical & Dye Corp., Paterson, N. J., to cover the East Coast; and W. Ronald Benson, Inc., 558 First Ave. S., Seattle, Wash., to handle sales in the Pacific Northwest.

Hoff Rubber Stamp Co., Inc., Minneapolis 2, Minn., produced what was claimed to be the largest hand-operated rubber stamp ever manufactured in this country. Made for the aeronautical research department of General Mills, Inc., the stamp was used to print *Svoboda*, the Czech word for "freedom," on plastic balloons which General Mills recently flew by the thousands in Europe for the "Crusade for Freedom" program. The giant stamp measured 36 inches long and five inches high at its printing surface and required a special stamping pad.

Phillips Chemical Co., Bartlesville, Okla., has reported that porcelain enameled steel stripping column trays used in synthetic rubber processing are compiling a remarkable service record of about 700 hours between cleanings and about 2,000 hours between enamelings. The approximate cost of maintaining a smooth coating on the trays is said to be approximately 41.6¢ per hour per stripping column. The company is using trays made off 11-gage enameling iron with 3/16-inch perforations and coated with a special corrosion-resistant grade of porcelain enamel developed and applied by Erie Enameling Co., Erie, Pa. Each vertical styrene stripping column utilizes 11 trays in series. As latex containing unreacted styrene is fed into the top of the columns and drips down through the perforations, steam rises from the bottom and removes the unreacted styrene by distillation. Because of the smooth, glass-like surface, the porcelain enameled trays show less clogging with latex than do trays made of other materials.

C. K. Williams & Co. has transferred George Foss to its Emeryville, Calif., office from Los Angeles, where he is succeeded by J. C. Plant, formerly with Bishop Conklin Co.

Golden Bear Oil Co., chemicals division, Oildale, Calif., has appointed W. D. Egleston Co., Cambridge, Mass., as New England representative. Other agents for Golden Bear products are Akron Chemical Co., Akron, O., for Alabama, Indiana, Kentucky, Michigan, western New York, North Carolina, Ohio, Oklahoma, western Pennsylvania, and Tennessee; Harwick Standard Chemical Co., Chicago, Ill., for Arkansas, Illinois, Iowa, Kansas, Louisana, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Texas, and Wisconsin; Harwick Standard Chemical Co., Los Angeles, Calif., for the West Coast; and H. M. Royal, Inc., Trenton, N. J., for Delaware, Maryland, New Jersey, eastern Pennsylvania, and West Virginia.

CANADA

To Build Blacks Plant

Cabot Carbon of Canada, Ltd., subsidiary of Godfrey L. Cabot, Inc., 77 Franklin St., Boston 10, Mass., has announced the immediate construction of a new 20,000,000-pound capacity oil furnace carbon black plant of modern design on a 15-acre site near the Polymer Corp., Ltd., plant at Sarnia, Ont. Representing an investment in excess of $2,000,000 the enterprise will be under the direction of Louis W. Cabot, vice president of Cabot Carbon. The plant will be completed as early in 1952 as priorities granted by the Canadian Government will permit and will reduce by about $2,000,000 the United States dollars now required for carbon black imports by Canada.

The new plant will produce primarily HAF (high abrasion furnace) blacks, but will include provisions for the manufacture of FEF (fast extruding furnace) blacks and other types as needed by the industry. Raw material for the production will come initially from refineries in the United States until the rapidly expanding Canadian refinery industry is able to supply the proper quality and type of aromatic liquid hydrocarbons.

The plant will be equipped with a complete smoke elimination system, utilizing special bag filters of synthetic fibers resistant to high temperatures, and will operate without delivering black or smoke to the atmosphere. The plant was designed by Cabot Engineering Co. and will be erected with funds supplied by Godfrey L. Cabot, Inc. When completed, the plant will employ 50-60 persons, utilizing Canadian personnel to the greatest possible extent. In the beginning some of the key technical positions will be manned by specialists from the Godfrey L. Cabot staff. While the plant will require its own analytical and control laboratories, it will call on the laboratories of the parent company for basic technical assistance.

Rubber Stocks Up

According to the Dominion Bureau of Statistics, stocks of rubber in Canada on September 30 reached 13,445 tons compared with 9,029 tons on September 30, 1950. Inventories of natural rubber totaled 6,485 tons, against 4,063 a year earlier; synthetic rubber, 4,412, against 3,250 tons, and reclaimed rubber, 2,548, against 1,716 tons.

Consumption of rubber in September amounted to 6,565 tons, against 7,226 in the same month last year. For natural rubber the figure was 3,180 tons, against 3,788; synthetic, 2,280, against 2,271; and reclaim, 1,105, against 1,167.

Domestic production of synthetic rubber in September 1951, totaled 5,568 tons, against 4,984 tons for the 1950 month; reclaim, 401, against 376 tons.

Crude rubber was imported into Canada in September to the extent of 4,301,216 pounds, value, $1,905,811. Other rubber imports that month included synthetic and substitute rubber amounting to 3,875 cwts., value, $138,437; recovered rubber 14,646 cwt., value, $135,778; and latex, 273,626 pounds, value, $149,331.

Naugatuck Sales Changes

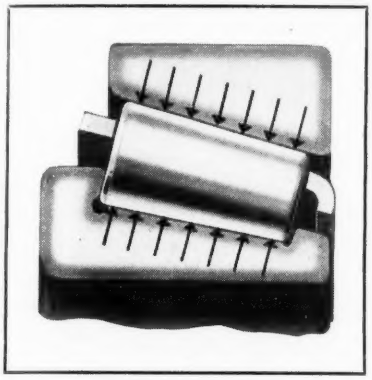
Naugatuck Chemicals, Elmira, Ont., division of Dominion Rubber Co., Ltd., has appointed two sales representatives of industrial chemicals, Edward W. May and James C. E. Fuller.

Mr. May started with Dominion Rubber in 1940 in the General laboratories in Montreal, P.Q., and later gained wide experience in the technical control department. He will represent the company in the industrial chemical field in the Province of Quebec, with headquarters in Montreal.

Mr. Fuller started with Naugatuck Chemicals in 1947 in the technical sales department at the Winnepeg branch and was transferred to Elmira this year. He will represent the company in western Ontario, with headquarters in Elmira.

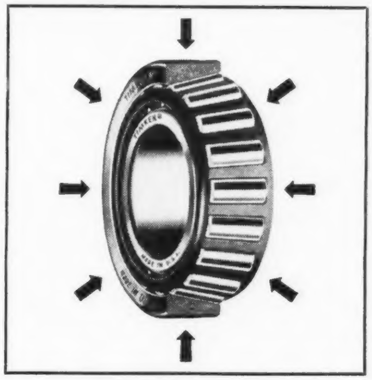
G. L. Griffiths & Sons, Ltd., Stratford, Ont., is offering a line of bevel-edge rubber mats in two sizes for many uses around home and automobile. The mats may be fitted into the car as individual items where feet track in most dirt and cause more wear. A beveled edge makes the mats lie flat, with less danger of catching the feet. The mats are available in black, brown, blue, or red.

What's your bearing problem?



HEAVY LOADS?

In Timken® bearings the load on rollers and races is spread evenly over a line of contact. The greater load area means extra load-carrying capacity.

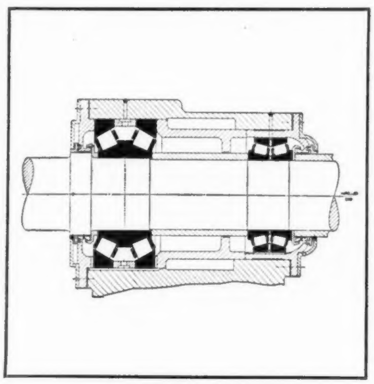


COMBINATION LOADS?

Because they're tapered in design, Timken bearings carry both radial and thrust loads. Auxiliary thrust bearings or plates are eliminated.

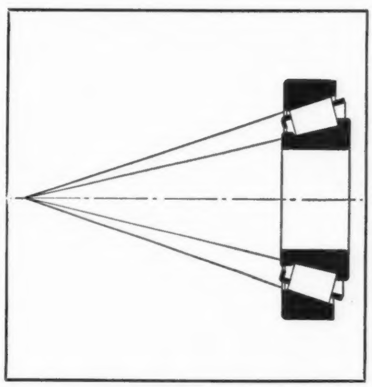
PRECISION?

Timken bearings hold shafts in alignment. Gears mesh with precision, assuring a smooth flow of power. Deflection is minimized, end-movement prevented.



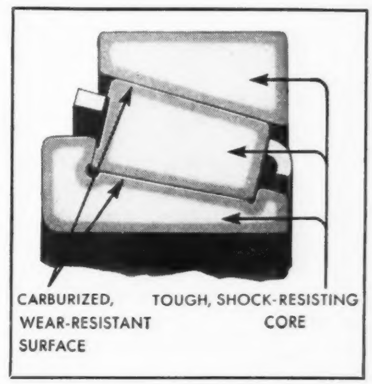
MAINTENANCE?

Closures are more effective because Timken bearings keep housing and shaft concentric. Dirt and grit are kept out, lubricant kept in. Maintenance time is cut to a minimum.



FRICTION?

Timken bearings roll freely due to true rolling motion. All lines coincident with the tapered surfaces of the rollers and races meet at a common point on the bearing's axis.



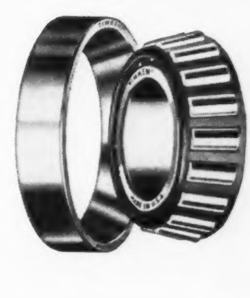
WEAR?

Rollers and races of Timken bearings are made of Timken fine alloy steel—case hardened to give them a hard wear-resistant surface and a tough shock-resisting core.

TIMKEN® bearings solve them all!

Be sure to specify Timken roller bearings for the machines you build or buy. Look for the trademark "TIMKEN" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ⏢ BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

NEWS ABOUT PEOPLE

M. Rea Paul has been made vice president of The Eagle-Picher Sales Co., Cincinnati, O., and will be in charge of the Washington office, where he will direct the company's government contacts. During World War II, Mr. Paul was chief of the WPB Protective Coatings Bureau and a deputy director, Research & Development Division, Synthetic Rubber Production; and he also served as chief of operations and contracting officer of the Smaller War Plants Corp. Before joining Eagle-Picher, Mr. Paul was with Frederic H. Rahr, Inc., color consultant. Mr. Paul will continue his activities as chairman of Committee E-12, ASTM, and as a member of the Optical Society of America, Inter-Society Color Council, and Illuminating Engineering Society.

J. W. Way, for three years development engineer of the athletic ball division of Sun Rubber Co., recently accepted a similar position with the W. J. Voit Rubber Corp., Los Angeles, Calif., for whom he had formerly worked.

A. Peter Dawson has been appointed assistant to the general sales manager of Gutta Percha & Rubber, Ltd., Toronto, Ont. He had been with the company in various capacities for 15 years and, now, after an absence of 18 months, rejoins it for special assignments in the engineering sales field.

James G. Barbour has been made vice president and a member of the management council of Chicago Rawhide Mfg. Co., 1301 Elston Ave., Chicago 22, Ill., to succeed the late Herman M. Koelliker, with whom Mr. Barbour worked for 30 years. The new vice president will be in charge of all the synthetic rubber operations of the firm's Sirvene Division.

A. W. Denny, vice president in charge of production, Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont., last month was elected a director of the company.

Theodore A. Werkenthin, a rubber consultant in the Navy's Bureau of Ships, on November 13 was presented with the Distinguished Civilian Service Award, the Navy's highest civilian honor, in recognition of his work on the uses of natural and synthetic rubber. He evolved a program working toward complete independence of foreign grown rubber, and now only 2 of 120 Bureau of Ships specifications require natural rubber.

Dan Budnick is now on the sales staff of Sierra Rubber Products & Engineering Co., Inglewood 5, Calif. He was formerly with Kirkhill Rubber Co.

Norman K. Lillis has been made general manager of operations at Reeves Rubber, Inc., San Clemente, Calif. He was formerly purchasing agent of Chrysler Corp., Los Angeles, which he had joined in 1934 and had served subsequently in every division dealing with materials handling, production, planning, and scheduling.

John M. Hamilton

John M. Hamilton has been elected vice president of Binney & Smith Co., 41 E. 42nd St., New York, N. Y. Mr. Hamilton joined the company as a salesman after graduation from Yale in 1933. In 1939 he was made assistant sales manager and advertising manager. This assignment was interrupted during World War II by some three years' service with the U. S. Navy. Rejoining Binney & Smith, he continued in his previous position until 1946, when he assumed the duties and titles of assistant to the president and sales manager of the carbon black division. In 1950, Mr. Hamilton became a director of the company and manager of pigment sales. He will combine these assignments with his new duties as vice president.

Maurycy Bloch has been elected vice president of Warwick Wax Co., Inc., Long Island City, N. Y. For the past several years Mr. Bloch has been sales manager of the company and will continue to direct sales.

Vernon P. Hall has been made southeastern sales representative, traveling Georgia, Alabama, Mississippi, and the Carolinas, for Hodgman Rubber Co., Framingham, Mass.

Eric O. Ridgway has been appointed director of research and development at Thermoid Co., Trenton, N. J. This appointment comes at a time of marked growth in Thermoid's production of rubber, asbestos and textile products for the automotive, industrial, oil field, and farm markets. Emphasis of research and development under Mr. Ridgway will be in the chemical field. Mr. Ridgway served as assistant to the president of a New Jersey rayon manufacturing concern before forming his own chemical research company in 1936. In partnership with others he later formed Ridbo Laboratories, Paterson, N. J.

Thermoid has acquired controlling interest in Ridbo, including patents on rubber compounding materials, drying oil properties, and rosin acid derivatives used in synthetic rubber and the synthesis of hormones.

Richard L. Huber has been named manager of the Cleveland office of the cellulose products department of Hercules Powder Co., Wilmington, Del. The office, at 925 Euclid Ave., will be an independent branch office and no longer under the department's office in Detroit, Mich. The area now under Mr. Huber's supervision will include Cleveland, Akron, and Pittsburgh. The Cleveland office is responsible for the sale and servicing of nitrocellulose, cellulose acetate, ethyl cellulose, chorinated rubber, chlorinated paraffin, and cellulose gum, which are used in the plastic, lacquer, textile, film, and other industries. Mr. Huber has represented the cellulose products department in Cleveland since December, 1946, when he transferred there from Detroit.

George R. Aldrich, formerly with Northrup Aircraft, is now chief engineer at Rubber Teck, Inc., Gardena, Calif.

Henry N. Lyons has been appointed manager of technical service by The Barrett Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y. Mr. Lyons, formerly with Devoe & Reynolds Co., will be responsible for technical service matters in Barrett's chemical sales section.

Matthew H. Wilson, 65, office manager of the eastern sales department, Canada Wire & Cable Co., Ltd., Leaside, Ont., died November 11. He had been with the company at its various branches since 1919.

Jack Knudson recently resigned from Kirkhill Rubber Co. to enter the partnership of Denny & Bates, in the formica business.

SPI Committees

(*Continued from page* 326)

committees have already been extended by Mr. Brown to all segments of the industry. Product manufacturers, raw material manufacturers, machinery producers, the trade press, and allied industries will all be represented on the two committees.

New Plastic Monomer

A NEW plastic monomer, triallyl cyanurate, is being produced by American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y., in pilot-plant quantities for industrial evaluation. The most promising application for the material is in the field of plastics and resins. Mats prepared by polymerizing the chemical on glass cloth have high flexural strengths even at temperatures above 230° C. Since triallyl cyanurate is compatible with many other monomers and with alkyd resins, copolymerizations are also readily performed, particularly for applications requiring heat and chemical resistance.

OBITUARY

Florain J. Shook

FLORIAN J. SHOOK, one of the early pioneers in tire building machinery design and a man who, for more than 30 years, continued to invent machinery which has substantially reduced the cost of building tires, died October 30 of double pneumonia.

Mr. Shook, a self-trained engineer, served his early years with the Morgan Engineering Co. (1907-1917). In 1918 he joined The B. F. Goodrich Co., where he was assigned to the development of tire building machines. Leaving Goodrich in 1926 to go with the Banner Machine Co., now a subsidiary of National Rubber Machinery Co., Mr. Shook continued to invent numerous improvements to tire building machines, many of which are still in daily use. From 1928 to 1931 he worked for National Rubber Machinery, then became associated with National-Standard Co., with headquarters also in Akron. He was its consulting design engineer even after his retirement in 1949.

The deceased was born in Randolph, O., January 8, 1882. He attended grade and high schools and studied mechanical engineering with the International Correspondence School.

Mr. Shook was a member of the Masons, Akron Men's Garden Club, and an elder of the High St. Church of Christ in Akron, where funeral services were held on November 1. Burial was at Randolph.

Surviving are his wife, two sons, and five granddaughters.

William W. Higgins

WILLIAM WALLACE HIGGINS, general sales consultant for the United Carbon Co., Charleston, W. Va., died suddenly of a heart attack at his home in West Caldwell, N. J., on November 2.

He was very well known in the carbon black and rubber industries for many years. From 1903 until 1917, Mr. Higgins was associated with Binney & Smith Co. In the partnerships, Higgins & Grant and Higgins & Rodenback, he continued to sell carbon black from 1917 to 1922, when he joined the Kosmos Carbon Co., which later combined with United Carbon Co. For many years "Bill" Higgins was eastern district manager for United Carbon with offices in New York, N. Y.

Mr. Higgins was also well known as a breeder of Irish setters, two of which won many prizes in dog shows as the most outstanding Irish setters ever shown.

A veteran of the Spanish-American War, the deceased was a member of the Montclair Encampment Spanish-American War Veterans and also of the Veterans of Foreign Wars. He was a member of the Division of Rubber Chemistry, A. C. S.; the National Paint, Varnish & Lacquer Association, and the National Association of Printing Ink Manufacturers. Other clubs included the Mount Vernon, N. Y., Elks Lodge, Excelsior Lodge 105, F.&A.M., and the Empire State Club.

"Bill" Higgins was born in Brooklyn, N. Y., November 30, 1877. He was educated in the public schools of Brooklyn and New York.

Mr. Higgins leaves a son, two brothers, and a sister.

Funeral services were held November 5 at his home in West Caldwell, followed by interment in the Prospect Hill Cemetery, Caldwell.

Blank & Stoller

William W. Higgins

John Bowles

JOHN BOWLES, 49, production superintendent, latex division, Pioneer Latex & Chemical Co., Middlesex, N. J., died on November 20 in Dunellen, N. J., of a heart complication.

Mr. Bowles was a native of Maryland, but his industrial life was chiefly spent in the rubber industry of northern New Jersey. He became associated with the Flintkote Co. in its laboratory and advanced to production manager of rubber operations in Whippany, N. J. He was briefly associated with Continental Can Co. and Dumont Laboratories and at the end of World War II joined Pioneer Latex in charge of latex production.

He is survived by a sister and a brother.

Carl D. Humphreys

CARL DICK HUMPHREYS, chemical engineer at the research laboratories of General Cable Corp., Bayonne, N. J., died suddenly November 1 from accidental causes.

Born in Pasadena, Calif., on June 20, 1912, Mr. Humphreys was graduated from the University of Southern California, where he received a B.S. degree in chemical engineering.

From 1933 to 1944 he was employed by The B. F. Goodrich Co. in Los Angeles and Akron. He later worked for Ryden Mfg. Co., Philadelphia, Pa., and in 1947 joined General Cable, where he became assistant research director in charge of rubber and plastics.

The deceased was a member of Phi Kappa Tau, the American Chemical Society, New York Rubber Group, and the committees ASTM D11 for Rubber, and ASTM D20 for Plastics. He also was a member of the First Methodist Church in Westfield, N. J., where funeral services were held November 3.

He is survived by his wife, four children, two brothers, and his mother.

FINANCIAL

Allied Chemical & Dye Corp., New York, N. Y. Nine months ended September 30: consolidated net income, $29,835,323, equal to $3.37 a common share, compared with $26,924,252, or $3.04 a share, for the 1950 period: sales, $376,459,661, against $291,889,740; taxes, $52,757,275, against $21,243,639.

American Cyanamid Co., New York, N. Y., and subsidiaries. January 1-September 30, 1951: net earnings, $29,165,313, equal to $7.14 each on 4,087,610 common shares, contrasted with $22,061,552, or $6.13 each on 3,597,344 shares, in the like period last year; net sales, $296,630,302, against $229,087,030; provision for income taxes, $43,000,00, against $23,200,000.

American Hard Rubber Co., New York, N. Y., and wholly owned subsidiary. Thirty-six weeks to September 9, 1951: net income, $649,872, equal to $6.45 a common share, against $476,943, or $4.49 a share, in the 1950 period; net sales, $16,004,571, against $10,145,966.

Baldwin-Lima-Hamilton Corp., Philadelphia, Pa., and wholly owned subsidiaries. First nine months, 1951: net profit, $2,583,088, equal to 54¢ each on 4,782,195 common shares, compared with $1,977,472, or 79¢ each on 2,375,298 shares, in the 1950 months; sales, $143,558,230, against $66,477,226.

Borg-Warner Corp., Chicago, Ill., and subsidiaries. Nine months ended September 30, 1951: net earnings, $15,448,265, equal to $6.43 a common share, compared with $23,715,259, or $9.95 a share, in the 1950 months; net sales, $295,350,299, against $243,713,151; provision for taxes, $27,191,295, against $17,119,083.

Brunswick-Balke-Collender Co., Chicago, Ill., and subsidiaries. Nine months to September 30: net profit, $735,496, equal to $1.43 a common share, against $1,853,294, or $3.90 a share, a year earlier; net sales, $18,195,854, against $22,525,866.

Diamond Alkali Co., Cleveland 14, O. Nine months ended September 30, 1951: net income, $5,005,112, equal to $2.23 a share, compared with $2,654,833, or $1.18 a share, in the 1950 period; net sales, $60,443,689, against $38,119,722.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Nine months ended September 30, 1951: consolidated net income, $150,771,780, equal to $3.34 a common share, against $210,303,130, or $4.67 a share, a year earlier; consolidated net sales, $1,150,723,049, against $927,562,749.

General Cable Corp., New York, N. Y. First nine months, 1951: net income, $3,679,996, equal to $1.62 a common share, contrasted with $1,125,081, or 36¢ a share, in the corresponding period of 1950; provision for taxes, $7,825,000, against $775,000.

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Boston Woven Hose & Rubber Co., Cambridge, Mass. Year ended August 31, 1951: net earnings, $1,211,44, equal to $13.66 a common share, contrasted with $713,740, or $7.84 a share, in the preceding fiscal year; net sales, $23,343,431, against $13,597,025; provision for income and excess profits taxes, $2,152,000, against $530,000; current assets, $9,171,211, current liabilities, $3,546,826, against $6,704,153 and $1,540,318, respectively, on August 31, 1950.

Dewey & Almy Chemical Co., Cambridge, Mass. First nine months, 1951: net earnings, $1,043,500, equal to $1.14 a common share, against $1,421,433, or $1.56 a share, in the 1950 months; net sales, $22,052,698, against $15,482,804.

The Eagle-Pitcher Co., Cincinnati, O. Nine months ended August 31, 1951: consolidated net earnings, $2,880,716, equal to $3.20 a share, compared with $1,891,866, or $2.12 a share, a year earlier; net sales, $62,383,220, against $46,331,350.

General Electric Co., Schenectady, N. Y. First nine months, 1951: net earnings, $85,936,000, equal to $2.98 a common share, compared with $112,919,000, or $3.91 a share, in the 1950 months; sales, $1,694,084,373, against $1,354,483,215; provision for federal incomes taxes, $201,000,000, against $98,000,000.

General Motors Corp., Detroit, Mich. Nine months ended September 30: consolidated net income, $372,790,913, equal to $4.14 a common share against $702,655,156, or $7.89 a share, in the 1950 months; consolidated net sales, $5,602,601,800, against $5,598,769,322; taxes, $740,219,000, against $604,601,000.

B. F. Goodrich Co., Akron, O. Nine months ended September, 30, 1951: net income, $24,500,272, equal to $5.75 a common share, compared with $21,967,990, or $5.20 a share, a year earlier; net sales, $479,956,064, against $389,099,197; provision for taxes, $60,373,000, against $31,319,000.

Hewitt-Robins, Inc., New York, N. Y. First nine months, 1951: net profit, $770,867, equal to $2.77 a share, against $778,742, or $2.79 a share, a year earlier; sales $26,254,814, against $15,709,284.

Mohawk Rubber Co., Akron, O. First nine months, 1951: net profit, $833,115, equal to $5.88 a share, against $2.26 a share, in the 1950 months; sales, $15,482,000, against $7,652,000.

National Lead Co., New York, N. Y. Nine months to September 30, 1951: net profit, $16,387,022, equal to $4.36 each on 3,386,125 common shares, contrasted with $18, 902,074, or $5.14 each on 3,360,325 shares, a year earlier; sales, $295,816,779, against $236,760,077; provision for federal taxes, $30,323,524, against $18,263,335.

Parke, Davis & Co., Detroit, Mich. Nine months ended September 30: consolidated net income, $12,893,949, equal to $2.63 a common share, against $11,988,669, or $2.45 a share, in the 1950 months; net sales, $102,861,249, against $76,078,984.

O'Sullivan Rubber Corp., Winchester, Va. Nine months ended September 30: net income, $172,656, equal to 38¢ a share, against $136,250, or 28¢ a share, a year earlier.

Phillips Petroleum Co., Bartlesville, Okla. January 1-September 30, 1951: net income, $49,751,662, equal to $3.74 a common share, compared with $35,885,522, or $2.96 a share, in the 1950 period; sales, $440,213,554, against $379,855,779.

Rome Cable Corp., Rome, N. Y. Six months to September 30: net profit, $729,549, equal to $1.56 a common share, against $639,798, or $1.50 a share, in the corresponding period last year.

St. Joseph Lead Co., New York, N. Y., and domestic subsidiaries. First three quarters, 1951: net income, $10,242,802, equal to $4.15 a share, against $7,757,770, or $3.14 a share, in the 1950 period; net sales, $84,220,610, against $72,398,505; income taxes, $10,265,518, against $3,486,471.

Shell Oil Co., New York, N. Y. First nine months, 1951: net income, $65,736,482, equal to $4.88 a share, against $62,700,268, or $4.65 a share, in the 1950 months.

Timken Roller Bearing Co., Canton, O. Nine months to September 30, 1951: net profit, $11,258,572, equal to $4.65 each on 2,421,380 capital shares, against $12,966,511, or $5.36 a share, in the 1950 months.

United States Rubber Co., New York, N. Y. First three quarters, 1951: consolidated net profit, $22,428,878, equal to $10.52 each on 1,761,092 common shares, compared with $15,857,158, or $6.79 a share, in the 1950 quarters; consolidated net sales, $632,700,279, against $487,136,916; provision for income taxes, $56,622,141, against $16,540,008.

U. S. Rubber Reclaiming Co., Inc., Buffalo, N. Y. Twelve weeks to September 9, 1951: net income, $74,224, against $80,653 in the corresponding period last year.

Rhode Island Club

(*Continued from page 329*)

Ohio Rubber Group. S. G. Byam, E. I. du Pont de Nemours & Co., Inc., and vice chairman of the Division of Rubber Chemistry, A. C. S., also spoke briefly on the Division and its relations with the local rubber groups.

A slate of candidates for officers of the group for the coming year was presented by the nominating committee, headed by H. P. Fuller, retired. The new officers follow: chairman, C. Leigh Kingsford, Davol Rubber Co.; vice chairman, Roy G. Volkman, United States Rubber Co.; secretary-treasurer, Francis B. Burger, Kleistone Rubber Co.; and directors (for three years), John MacKay, Phillips Petroleum Co., and W. Kenneth Priestley, U. S. Rubber. Other directors of the group are: Raymond Szulik, Acushnet Process Co.; Gilbert Enser, Collyer Insulated Wire Co.; Urbain J. H. Malo, Crescent Corp.; and Harry Ebert, Firestone Tire & Rubber Co.

New Emery Wax

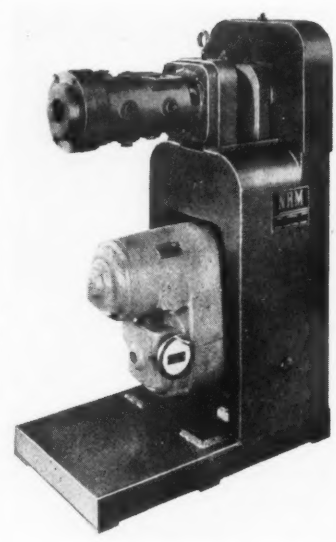
EMERY C-842-R STEARONE, a new product available in experimental quantities, has been announced by Emery Industries, Inc., Carew Tower, Cincinnati 2, O. A white crystalline solid having a melting point of approximately 75° C., the new material is insoluble in water and only slightly soluble in hot alcohol or ether. A 35-carbon atom straight-chain ketone, the new product is suggested for use as a wax or wax extender. Further information and samples of the material are available from the company.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Anaconda Wire & Cable Co.	Com.	$0.75	Oct. 23	Oct. 11
		1.75	Dec. 18	Dec. 7
Boston Woven Hose & Rubber Co.	Com.	5.00 spec.	Nov. 26	Nov. 15
		0.75	Nov. 26	Nov. 15
Crown Cork & Seal, Ltd.	Com.	0.50 q.	Nov. 15	Oct. 15
Dayton Rubber Co	Com.	0.45	Oct. 25	Oct. 10
	$2.00 Cl. A	0.50 q.	Oct. 25	Oct. 10
Detroit Gasket & Mfg. Co.	Com.	0.25	Oct. 25	Oct. 10
De Vilbiss Co	Com.	0.25 q.	Oct. 19	Oct. 9
E. I. du Pont de Nemours & Co., Inc	$4.50 Pfd.	1.12½ q.	Oct. 25	Oct. 10
	$3.50 Pfd.	0.87½ q.	Oct. 25	Oct. 10
Firestone Tire & Rubber Co	Com.	100% stk.	Oct. 25	Oct. 11
General Cable Corp	Com.	0.15	Oct. 1	Sept. 27
	1st Pfd.	1.00 q.	Oct. 1	Sept. 27
	2nd Pfd.	0.50 q.	Oct. 1	Sept. 27
General Electric Co	Com.	0.75	Oct. 25	Oct. 1
Goodall Rubber Co.	Com.	0.15 q.	Nov. 15	Nov. 1
	Pfd.	2.50 s.	Nov. 15	Nov. 1
Goodyear Tire & Rubber Co	Com.	0.75	Dec. 15	Nov. 15
		0.50 extra	Dec. 24	Dec. 15
	$5.00 Pfd.	1.25 q.	Dec. 15	Nov. 15
Goodyear Tire & Rubber Co. of Canada, Ltd.	Com.	1.00	Dec. 31	Dec. 10
Lee Rubber & Tire Corp	Com.	1.50 extra	Oct. 30	Oct. 15
		0.75 q.	Oct. 30	Oct. 15
Midwest Rubber Reclaiming Co.	4½% Pfd.	0.56¼ q.	Jan. 1	Dec. 7
National Automotive Fibres, Inc	Com.	0.50 q.	Dec. 1	Nov. 10
Okonite Co	Com.	0.50	Nov. 1	Oct. 15
Parke, Davis & Co	Com.	0.10 spec.	Oct. 31	Oct. 5
		0.45	Oct. 31	Oct. 5
Thermoid Co	$2.50 Cv. Pfd.	0.62½ q.	Nov. 1	Oct. 15
	Com.	0.20 q.	Dec. 31	Dec. 18
		0.15 extra	Dec. 31	Dec. 18

New Machines and Appliances

NRM Rubber Extruder

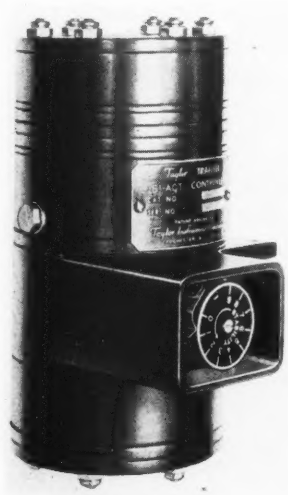


New NRM 1½-Inch Standard Rubber Extruder

A NEW low-cost 1½-inch rubber extruder has been added to the line manufactured by National Rubber Machinery Co., Akron, 8, O. Designed the NRM 1½-inch standard model, the extruder is designed for flexibility of use in both experimental work and for the continuous production extrusion of small cross-sections.

The new machine is compact in design, yet retains all the major features of the company's larger rubber extruders, including standard alloy steel, heat-treated screw with hardened flight surfaces, replaceable Xaloy lined cylinder, and proven-type circulating jackets. The feed box is designed for hand-feeding, with a standard undercut which can be varied to satisfy extremes in stock conditions. The extruder is powered by a self-contained 3-hp. variable-speed motor.

New Non-Indicating Controller

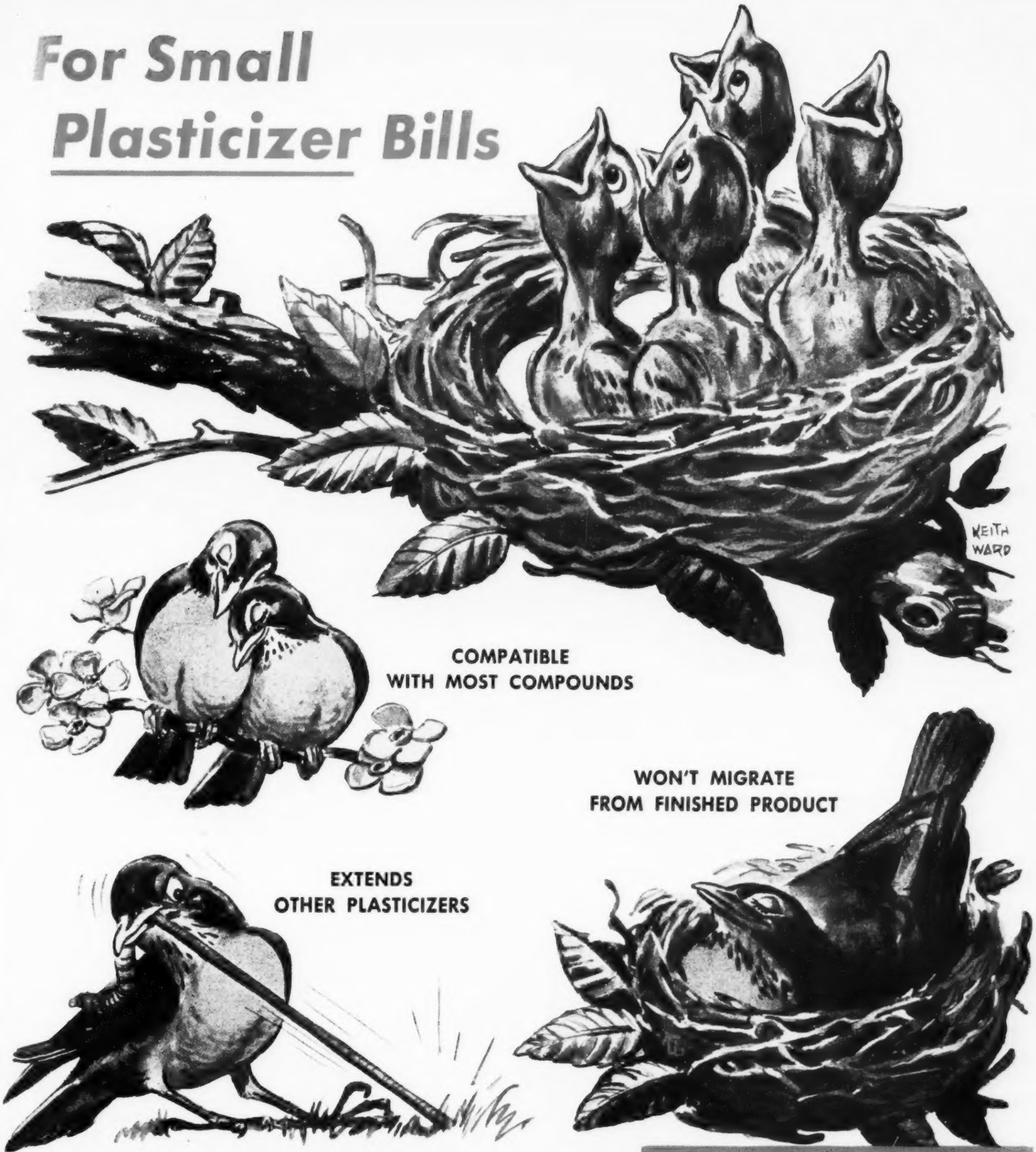


Taylor Transet Bi-Act Controller

A NEW, non-indicating, force-balance controller with one-knob adjustment for two control responses has been introduced by Taylor Instrument Cos., 95 Ames St., Rochester 1, N. Y. Designated the Transet Bi-Act Controller, it is designed for use in applications where it is desirable to transmit the measured variable to some remote location. The controller is particularly adaptable to flow, liquid level, or pressure applications requiring fast reset rates and broad throttling bands, as well as applications where derivative action is not essential.

Features of the controller include a new and simplified control circuit which pneumatically links together the proportional and automatic reset responses; single-knob adjustment; quick changing of controller action without disturbing any piping connections; optional plug-in type leakless manifold to provide a simple means for connecting or removing the controller; large-capacity booster air relay for rapid action; and built-in cut-off relay to permit either panel or field mounting. The controller measures only 7½ inches in overall length and can be adjusted to provide 1-200% throttling range and automatic rest of 0-100 repeats a minute.

For Small Plasticizer Bills



S/V SOVALOID C gives you all these processing benefits at extremely low cost

You can't beat this inexpensive plasticizer for Vinyl resins and Buna N. It costs but a fraction of conventional ester-type plasticizers – yet offers many processing advantages.

S/V *Sovaloid C* is completely compatible with all Vinyl and Buna N compounds. It imparts flexibility . . . provides unusual oil-resistant qualities . . . adds greater tensile strength . . . won't bleed from the finished product. It also can be used as an extender of more costly plasticizers.

Get all the facts about S/V *Sovaloid C* from your Socony-Vacuum Representative.

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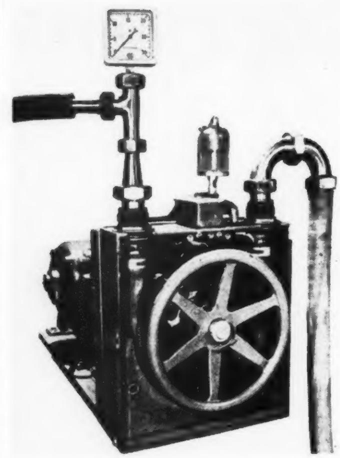
New Latex Pump



Lanham Latex Pump Uses Tube Compression Principle

A NEW pump has been developed by Lanham Machinery & Service Co., Atlanta, Ga., for use with latex and other difficult-to-handle materials. The pump is of the elastic tube compression type, with the tube disposed on the inner periphery of a semi-circular crade, and compression is accomplished by a series of rotating rollers mounted on a disk. This specialized design makes the pump adaptable to many chemical and food processes because it does not have any sliding surfaces or valves; does not create any mechanical shock, churning action, or admit any air under circumstance; and is quickly cleaned, completely non-corrosive, and sterile.

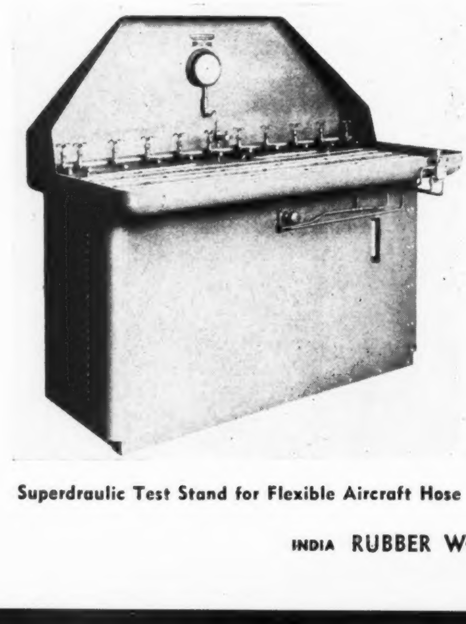
The compression tube can be made of different types of rubber, depending on the application. Pump capacity varies with the model; the pump illustrated herewith has a capacity of 7,000 pounds of latex per hour at low pressure, and 2,000 pounds of latex per hour against pressures up to 50 pounds and/or a limited vacuum (when operating against the back pressure of latex foam sponge compounding machines.) This model is driven by a ¾-hp. motor through a 3:1 ratio variable-speed drive and speed reducer. The pump and drive are assembled on a steel plate 18 by 24 inches in size and is approximately 16 inches high.

The pump is provided with a tube pressure release actuated by the hand-wheel to facilitate cleaning and tube replacement. To replace the tube, the hand-wheel is turned 90 degrees to loosen the fitting nut; the old tube assembly slid out, and the new tube assembly put in. The entire replacement operation is said to take less than five minutes. A transparent plastic plate acts as a guard for the pump, but permits constant observation of the moving parts. A lubricator is provided over the tube to increase the service life of its outer liner.

Hose Test Stand

A HYDRAULIC test stand designed for testing flexible hose used in aircraft has been announced by the Superdraulic Corp., Detroit 4, Mich. With modifications, this stand can also be used for testing valves, cylinders, and other hydraulic equip-

(*Continued on page* 356)



Superdraulic Test Stand for Flexible Aircraft Hose

New Goods and Specialties

Inflated Play Hats

Loony Lids Inflatable Play Hats for Children

LOONY LIDS, inflatable vinyl plastic play hats, are being manufactured by Ideal Toy Corp., New York, N. Y., from Bakelite's Vinylite plastic. Colorfully printed to resemble lions, elephants, horses, and roosters, the inflated headpieces will withstand considerable horseplay and rough usage, it is claimed. When deflated, the headgear folds up and can be tucked away in a youngster's pocket. A few puffs of air quickly inflate the play hat, which fits snugly on a child's head by means of a cord tied under the chin. The durable vinyl plastic is resistant to oils, greases, and sticky fingers, as well as abrasion.

Velon Draperies

FIRESTONE PLASTICS CO., Pottstown, Pa., recently displayed plastic draperies made from new fabric-like texture patterns in its Velon film at a reception for customers of its Velon drapery film division, as well as curtain and drapery buyers. Held in the Rainbow Grill atop the RCA Building, New York, N. Y., the reception followed a broadcast of the "Voice of Firestone" radio and television show, which the guests also attended.

The new patterns, Canadia and Moresque, were created by Walter Litter exclusively for plastics and show true fabric texture and dramatic contrast between lustrous and dull surfaces. Both designs are available in the following seven colors: chartreuse, russet, silver gray, champagne, ice blue, pagoda green, and sparkling red.

Roger S. Firestone, company president, acted as host at the reception, and other company representatives included Elmer French, vice president in charge of sales; E. T. Handley, vice

SEE PAGE 264

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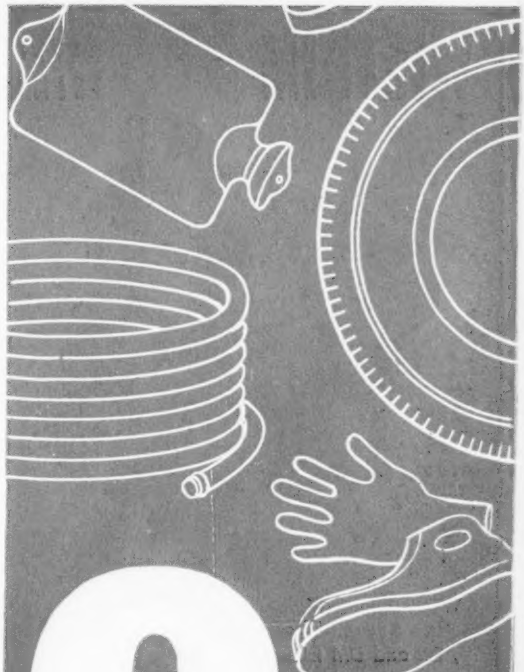

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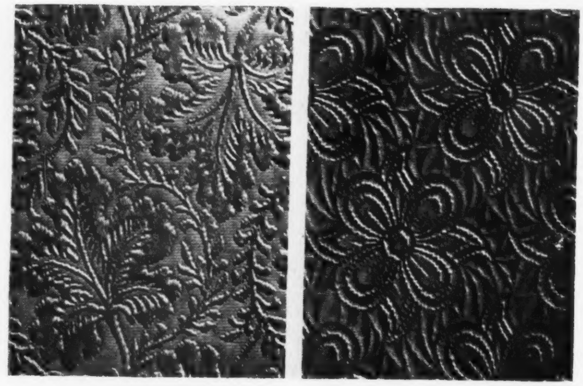


New Fabric-Like Texture Patterns for Velon Plastic Draperies Include *(Left)* Canadia and *(Right)* Moresque

president in charge of production; and Kenneth L. Edgar, sales manager of the film division. Officials of the parent company, Firestone Tire & Rubber Co., who also attended included Harvey S. Firestone, Jr., board chairman, and John L. Cohill, assistant to the president.

Flexible Rubber Door

Shock Absorbing, Flexible Rubber Door for Cold Storage Warehouses

A SWINGING rubber door, so light and flexible that it can be bent to a right angle, has been developed by Stic-Klip Mfg. Co., Cambridge, Mass., to replace heavy wooden doors in cold storage warehouses. The new door will eliminate the costly maintenance and damaging of conventional wooden doors caused by power trucks banging into the doors to open them. The rubber door swings open at a touch, easily absorbs the shock of the trucks, gives maximum ese of passage, and returns to its normal closed position after passage.

Actually a reinforced rubber air container, the door is constructed of an outer layer of heavy cloth-inserted rubber which covers a "frame" of two-inch rubber tubing. Support and resiliency are provided by 15-25 inflated rubber bladders specially designed and manufactured by Dewey & Almy Chemical Co. These bladders, running cross-wise inside the rubber facing, are positioned between rubber spacers and inflated by a hand-pump through protruding valves. Although 2½ inches thick, the door has high insulation value, a smooth outside surface, very little inertia, and a weight about one-third that of conventional doors. The rubber door is suspended on hinges attached to steel strips running along one side. Although designed specifically for cold storage warehouses, the rubber door is believed applicable to hospitals, schools, or other installations where swinging doors are used and shock absorption is a factor.

Hose Test Stand

(*Continued from page* 352)

ment. Manufactured to meet specific test purposes, the stands include pumps, relief valves, oil reservoirs, electric motors, flexible couplings, and incidental valves and piping. Superdraulic test stands are built to provide test pressures up to 5,000 psi. by using large-volume pumps, and up to 30,000 psi. by using special booster equipment. The stands can be modified to include accumulator or cycling equipment as well as timing devices and to employ any type of hydraulic oil for test purposes.

EUROPE

GREAT BRITAIN

GR-S X Technique Controversy

Quite a revealing little debate was started some months ago when H. C. Harrison stated in a brief item in *India Rubber Journal*[1] apropos of GR-S X that it appeared to be a development of an oil technique discovered by him during the war and published in a War Services pamphlet. The "technique" consisted in soaking thin sheeted GR-S in mineral oil overnight; the rubber then absorbed up to 50% of its weight in oil, but generally 20 to 25% was allowed, and the treated GR-S could then be processed with less trouble than natural rubber.

A contributor to *Rubber Age & Synthetics*[2] set out to refute the claim of discovery pointing out that if Mr. Harrison seriously considered GR-S X a development of the oil-soaking process, then any method involving the addition of a mineral oil, other processing aid, or tackifying agent "could be said to have preceded both Mr. Harrison's alleged discovery, as well as the newly disclosed American process." The latter, he added, is an offshoot of American emulsion polymerization techniques. Mr. Harrison duly replied, admitting that the oil technique was not new, but insisting that the publication of the "oil technique" pamphlet in the United States after the war might have stimulated interest in oil again in the United States, "with the result that our American friends should be given full credit for any advance in the GR-S manufacture."

Meanwhile W. J. S. Naunton took up the question;[3] he began by defining a discovery as something epoch-making or fundamental; whereas a new process might be merely the application of an old technique to a new purpose, and then he gently brushed aside Harrison's original claim of a discovery. Next he proceeded, for some obscure reason, to take up the cudgels for the German scientists who had first developed Buna in the following words:

"It is curious how mny American (and also British) authors tend to disregard Germany's great and fundamental contributions to the synthetic rubber field. The writer has always found Americans only too willing to acknowledge verbally the help they have received from Germany, but on paper many of them appear to forget this fact. The American contribution to synthetic rubber was chemical engineering. The construction of these vast plants in such a short time was a wonderful achievement, but the processes used in them were based largely on German discoveries."

W. H. Stevens could not let this pass and in a full-length article[4] showed, by extensive quotations from Frank A. Howard's "Buna Rubber," published in America in 1947, that Americans are quite prepared to give credit where it is due and have not shrunk from recognizing the German inventions in print also.

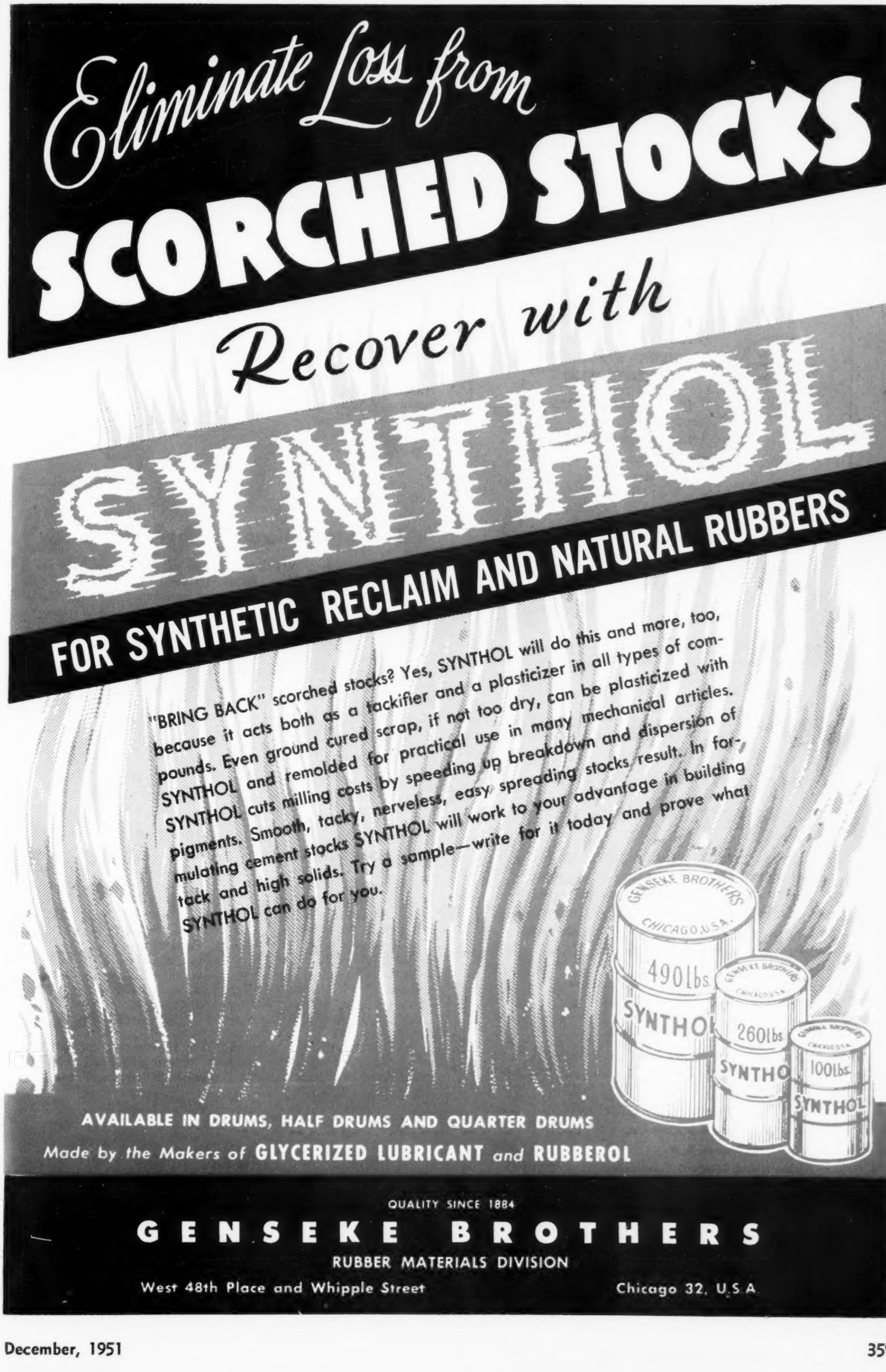
[1] May 19, 1951, p. 10.
[2] July, 1951, p. 151.
[3] *India Rubber J.*, Aug. 18, 1951, p. 11.
[4] *Ibid.*, Sept. 22, p. 7.

Notes

Cast latex models of the human heart and of a human fetus, with anatomical detail marked in color, are the latest additions to the series of anatomical models manufactured by Educational & Scientific Plastics, Croydon, Surrey. The first is a large-scale model dissected to give a clear idea of the way the heart functions; the model of the unborn child is designed to show the blood circulation between mother and child.

The Rubber Raw Material Group, Bloemfontein Ave., London, W.12, of which Lord Strabolgi is chairman, has announced that its subsidiary, Rubber Raw Material S.A., Brussels, Belgium, has opened a branch office in Paris: Rubber Raw Material S.A., 13 Rue Marivaux, Paris 2, France—telephone, Opera 70-68; telegrams, Rawrubber Paris. This new office will enable the company to give better service to its customers in France, requiring crude rubber, reclaimed rubber, waste rubber, chemicals for the rubber industry, plastics.

F. H. Cotton was appointed head of the National College of Rubber Technology, effective September 1. Known for his work on the role of oxygen in the mastication of natural rubber, Dr. Cotton has also for many years been active in training students in rubber technology.



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"BRING BACK" scorched stocks? Yes, SYNTHOL will do this and more, too, because it acts both as a tackifier and a plasticizer in all types of compounds. Even ground cured scrap, if not too dry, can be plasticized with SYNTHOL and remolded for practical use in many mechanical articles. SYNTHOL cuts milling costs by speeding up breakdown and dispersion of pigments. Smooth, tacky, nerveless, easy spreading stocks result. In formulating cement stocks SYNTHOL will work to your advantage in building tack and high solids. Try a sample—write for it today and prove what SYNTHOL can do for you.
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Rubber-asphalt mixtures have been used for the first time for surfacing an airport perimeter track. This occurred when, at the request of the Air Ministry, experimental sections were laid at Ringway Airport, Manchester.

In a recent experiment to test bitumen-rubber roads, sections of three different streets in Bristol received an asphalt topping containing 2% of rubber powder, supplied by Anglo-American Asphalt Co., Ltd., Bristol.

Research workers at the Ministry of Supply Royal Aircraft Establishment have reportedly developed a new method of building aircraft in which is employed a high-strength plastic material molded to shape.

The Research Association of British Rubber Manufacturers, after looking for some time for new headquarters more suitable and convenient than the buildings at Croydon, decided to buy a building at Shawbury, near Shrewsbury. The structure, for the most part one-story, has a total floor space of 14,000 square feet—enough for all the activities of the association at present. Since the property includes 6½ acres of level land, there is ample room for expansion.

Dunlop Rubber Co., Ltd., will add to its works at Dumfermline, Scotland, a plant for doubling and weaving rayon for tire cord and of cotton for tire belting fabric.

Witco Chemical Ltd., has moved from 101 Baker St., London, W.1, to larger and more centrally located officies in Bush House, Aldwych, London, W.C.2, as a result of the expansion of its business. The telegram addresses are Oxicolode, Estrand, London, and Wishtum, Estrand, London. Cables will reach the office when addressed to either Oxicolode, London, or Wishtum, London.

For International Rubber Technology

On September 27 a sub-committee of the Council of the Institution of the Rubber Industry met delegates from rubber manufacturing interests in Norway, Sweden, Denmark, Holland, Belgium, and Switzerland to discuss establishing an internationally recognized qualification in rubber technology based on the IRI diploma.

It was agreed that it was desirable for students and others in the rubber manufacturing industry in different countries to work to a common syllabus for a mutually recognized diploma: that courses and examinations should be on a national basis set to an international standard, and that national diplomas should be linked with those of the IRI so that the same standard of attainment would be represented. A working committee will be set up shortly to settle details. Meantime France, Italy, Germany, and Austria have also been invited to participate.

International Standardization for Tests

The fourth meeting of the International Standards Organization Committee on Rubber Test Methods was held at Oxford from October 1 to 5, when delegates from ten countries attended. Altogether 15 subjects were discussed, for five of which draft I.S.O. proposals were approved: tension testing, tear strength, hardness, abrasion, and ply adhesion. Good progress was made with the other subjects: rubber-to-metal bonding, micro-hardness testing, cold resistance, flexcracking and crack growth, classification of vulcanized rubber, latex, aging, dynamic testing, mechanical conditioning, and technical classification of raw rubber.

The next meeting, scheduled for the Spring of 1953, will discuss also terms and definitions, determination of copper and manganese in raw rubber, compression set, and electrically conducting rubber.

GERMANY

New Machines Being Marketed

German manufacturers of testing and measuring apparatus, especially of the universal, vertical type, for the rubber and allied industries showed several new models at the Technical Industrial Fair at Hannover this summer.[1] Many devices come

[1] *Kautschuk u. Gummi*, 4, 8, 296 (1951).

equipped with variable-speed controls with a range from 0 to 1,000 mm/min.

The new tester put out by Alb. v. Tarnogrocki has hydraulic oil drive permitting variable speeds from 1 to 1,200 mm/min. and determines tensile, elongation, permanent set, and elasticity of plastics and textiles as well as of rubber. This tester is supplied in five models each having three measuring ranges. The same firm makes a universal testing machine for tensile, compression, and flexing, equipped with hydraulic or electronic control, which is available in three models each with three measuring ranges. Speed control (in operation and on return) up to 300 mm/min. makes the machine also suitable for elongation and elasticity determinations. The inclination pendulum is used as a load indicator; when the sample breaks, the inclined pendulum, damped by an oil-brake, automatically returns to its starting position; maximum stresses can be read from a dial later. Activation is by rotary current over a hydraulic drive, or by electronic motor control. The entire speed range can be regulated at once and several load measuring levels are provided for testing samples of varying strengths.

Karl Frank, G.m.b.H., also has a testing machine for various materials including rubber, but it seems more especially designed for yarns. Variable speed is from 5-1000 mm/min., and here too an inclined pendulum serves as a load indicator.

The testing machine by Otto Wolpert Werke, G.m.b.H., is equipped with a friction drive with variable speed (6-600 mm/min.) which permits the recorder to operate during the reverse motion also and draws hysteresis loops.

Mechanische Werkstatte Lola, G.m.b.H., make eight styles of strength testers with load range from 0.5 to 1,000 kg., and variable speed of 100-1000 mm/min. The company also recently designed an electrically driven device to test scuff and kink resistance of textiles (wet and dry) and yarns; it has variable control of scuffing amplitude and number of revolutions and disconnects automatically.

The new apparatus put out by Zwick & Co. includes:

(1) A mechanically driven universal testing machine for tear, flex, shear, and compression work which has variable-speed control, quick return (constant at 1,000 mm/min.), automatic cut-off, recorder, and elongation measurement the whole way. The gripping clamps are adjustable to the sample to be tested.

(2) An abrasion testing machine which consists of a housing containing the motor, screw drive, abrading wheel, and loading arrangement. The path traversed by each sample is recorded by a counter which stops the machine when the position for which it has been adjusted is reached. The grinding track is kept clean by a blower which at the same time acts as air cooler for the testing cell of the device. A built-in thermometer measures temperatures between 100 and —40°C.

(3) A controlling and adjusting device for hardness testers.

(4) A horizontal machine for testing cable covers, rubber thread and rubber samples.

For the footwear industry, Maschinenfabrik Albert Stubbe provides abrading machines operating with 25 rotary, interchangeable abrasion tools. The device is adaptable for grinding with emery paper or grindstone. The tools are cooled by five ventilators which at the same time remove the dust to a chute to the rear of the structure. A smaller model of this machine, with seven tools, is also available.

The company has devised a machine for the dynamic flex-testing (impact-bending) of rubber soles which is capable of imparting 30,000 impacts in four hours and is said to be particularly suited for testing profiled soles.

Finally, Pruefmaschinen, G.m.b.H., has developed a device for controlling mixing machines made by A. M. Erichsen & Son, Ltd. A line-tracer draws diagrams which control the mixing time, the space between mixing rolls during the mixing process, the number of cuts, and the moment when the different ingredients must be added.

Plastic Adhesives

Experience in the use of plastic adhesives in the manufacture of plywood has shown that best results are obtainable with comparatively thin layers of highly concentrated adhesive applied as uniformly as possible. At the Badische Anilin und Soda Fabrik, Ludwigshafen a.Rh., it was found some time ago that good union is assured with urea resin-based adhesives foamed to give an increase in volume of 70 to 80%. Foaming is effected chemically or mechanically. In the latter case air is beaten into the plastic that has previously been mixed with a foaming aid which at the same time acts as a stabilizer. Adhesives of this type are widely used in the production of plywood and more recently are also finding application in the manufacture of furniture.

An 800 TON HYDRAULIC PRESS....

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THIS Erie Foundry Company 800 Ton Precision Hydraulic Press is designed and built to close tolerances. A number of these special presses purchased by one of the nation's largest rubber processors, are required in precision molding of special rubber products. Your specifications for precision presses are in capable hands when you send them to Erie Foundry Company. A half century of engineering and craftsmanship is at your command. Write for bulletin 350.

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White Reinforcing Materials

The development of white reinforcing agents in Germany was chiefly stimulated by the demands of World War II when it became necessary to husband supplies of carbon black for essential military purposes. As early as 1940, development work on alumina gel to replace carbon black was under way, and by 1941 a few hundred tons could be made available to the rubber industry. By the end of the war up to 1,000 tons a month were being produced for use mainly in the manufacture of brown Buna soles and heels for the people. The immediate postwar period briefly interrupted this work, but when the Rubber Association was set up, systematic research was initiated with, as an end, the production, with light-colored reinforcing agents, of light-colored rubber goods having all the good qualities of carbon black-filled products. However, since experience had so far been gained on synthetic rubbers, a whole series of new problems had to be solved, such as the developing of suitable dispersing agents and softeners, before the new reinforcers could be used on natural rubber.

In 1947 the Economic Association of the Rubber Industry and the Economic Association of the Chemical Industry, together founded the Working Association for Light-Colored Reinforcing Fillers, in which producers and consumers of fillers, chemists, and rubber technologists collaborated. New fillers were produced, as the highly active Aerosil (silicic acid) and amorphous silicates like aluminum silicate and calcium silicate (Calsil).

The latest types of light-colored reinforcers that have been developed as a result of the activities of the association are claimed to have proved markedly superior to carbon black in their effect on the abrasion and impact resistance, elasticity, and resistance to mechanical strain of vulcanizates. Figures recently published[1] show the increased use (in tons) of these materials in the German rubber industry, as follows:

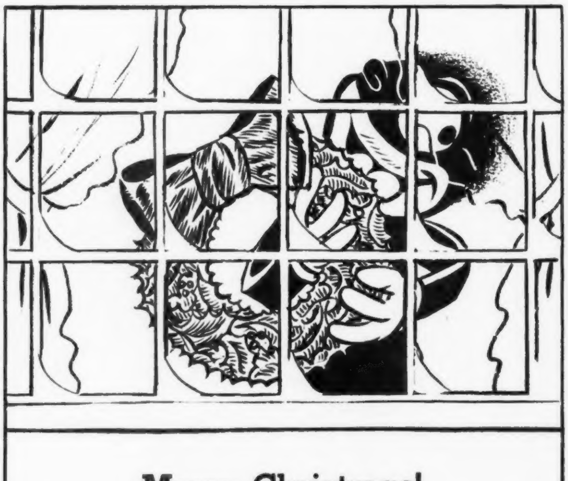
	Natural and Synthetic Rubber	Carbon Black	Black as % of Rubber	White Reinforcers	White Fillers as % of Rubber
1949.......	69,274	14,366	20.6	1,829	2.6
1950.......	83,290	15,246	18.3	3,021	3.6
Jan.-May 1951.......	39,176	7,433	19.0	1,952	5.0

Those interested in the production of white reinforcers are optimistic about the further development of the products; various shortages are bound to affect the output of carbon black here before long, it is felt, and meantime research in the indicated direction will be pursued with increased energy.

[1] *Kautschuk u. Gummi*, 4, 9, 311 (1951).

Plastics Convention, 1951

A conference, organized by various plastics and allied associations, was held at Wiesbaden from October 22 to 26. According to the advance program, the following papers were scheduled:



Merry Christmas!

SEE PAGE 264

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"Advances in Injection Molding and Injection Molding Materials Based on Polystyrene, Polyethylene, and Polyamid," H. Beck.

"Problems in Connection with the Use of Molding Materials by Design Engineers," G. B. von Hartmann.

"Possibilities of High-Frequency and Impulse Heat in Welding Foils," T. von Hauteville.

"Plastic Foils for Wrapping and Similar Purposes," O. Herrmann.

"Measuring the Elasticity and Viscosity of Molten Polyethylene," E. A. W. Hoff (England).

"Adhesion of and with Plastics," O. Jordan.

"Processing Plastics with Screw Machines," S. Kiesskalt.

"The Significance of the Agreement on the Relaxation of Industrial Control for the Plastics Industry," L. Kollek.

"The Technique of Employing Mixed Polymers from Asymmetrical Ethylene Dichloride and Vinylchloride," P. Kraenzlein.

"The Processing and Use of Araldit as Bonding Material and as Casting Resin," K. Meyerhaus (Switzerland).

"Recent Polyadducts and Their Technological Possibilities," H. Orth.

"Recent Developments with Cellit (Cellulose Ester) Injection Molding Materials," W. Rohm.

"Developments in Plastic Floorings," Hj. Saechtling.

"Determination of the Gelling Capacity of PVC at Temperatures in the Range of 100-160° C. by Means of the Brabender Plastograph," P. Schmidt.

"Polyisobutylene and Its Applications," A. Schwarz.

"Nature and Problems of Plastics Research," R. Vieweg.

"Notes on the Testing of Plastics," D. J. van Wijk (Holland).

"High Vacuum Evaporation for the Metallization of Plastics," L. Hiesinger.

MALAYA

(Continued from page 321)

Gambling on Devaluation

Reports in the daily press in Malaya reveal that Malayan rubber traders, especially Chinese in Singapore, are gambling on the possibility that Britain may devalue the pound again. Speculating dealers are willing to take an immediate loss of six or 7 cents a pound by selling Grade 3 or 4 rubber to the G.S.A., then arranging with banks to hold the proceeds in United States dollars for six months, on the chance that the pound will be devalued within that period and leave them a very handsome profit. If, for instance, there is a 25% devaluation within the period, a dealer would make himself a profit of 30 cents (S. S. currency) per pound of rubber at present prices.

It is obvious that this kind of gambling, if sufficiently widespread, would affect the price of rubber, for as increasing amounts of rubber were sold below the market level, the G.S.A. would be tempted to cut prices again, it is pointed out, and it is added that earlier slashes by the G.S.A. followed on this type of gamble.

Conservative Victory Ups Dividends

Feeling that the Conservatives newly returned to power in England would not be likely to limit dividends, directors of various Malayan rubber companies, immediately after the news of Churchill's victory, announced new dividends. Thus Golden Hope declared a 25% dividend, bringing the total for the year ended February, 1951, to 45%, compared with 10% the year before.

Bukit Mertajam will turn out a final dividend of 15%, which had been temporarily frozen, giving a total of 25% for its business year.

Pahang Consolidated declared a final dividend of 45%, to give a total of 75% for the year ended July, 1951, against 30% last year. East Asiatic Rubber Estates decided to pay 10% interim for the current year, and Kuala Reman Rubbers, which had turned out 5% in 1950 and nothing for the eight preceding years, also paid a 10% interim, making the total for the year 15%.

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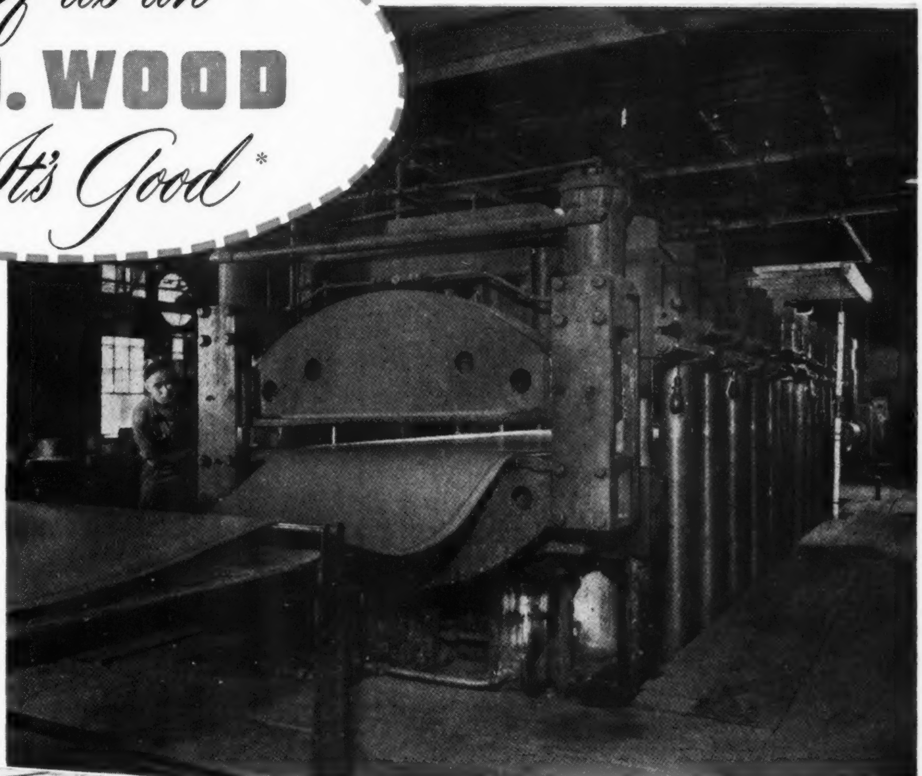

3,180-ton single opening hydraulic belt press used for vulcanizing rubber belting. Twenty-four cylinders are arranged in pairs which can be cut out at any time, or can be removed from the press without dismantling any other part.

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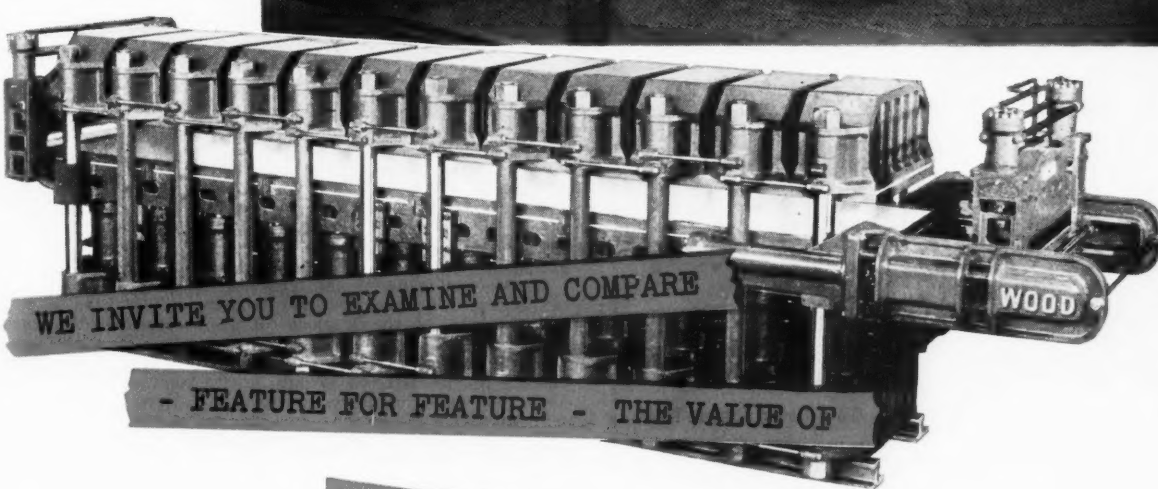

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Editor's Book Table

BOOK REVIEWS

"The Surface Chemistry of Solids." S. J. Gregg. Reinhold Publishing Corp., 330 W. 42nd St., New York 18, N. Y. Cloth, 5½ by 8½ inches, 306 pages. Price, $8.50.

Emphasizing general principles throughout, this book presents a systematic survey of the different branches of the surface chemistry of solids. Instead of providing detailed descriptions of individual observations, the author treats this rapidly expanding field from the standpoint of fundamental principles. Adsorption, adhesion, spreading phenomena, catalysis, and related effects are all discussed as being the results of the presence of a field of force at the surface of the solid in its contact with a liquid, gas, or another solid. While some branches of the subject are omitted, such as colloidal sols, electrode processes, and electrokinetic phenomena, the author succeeds admirably in his stated intention of presenting a brief but lucid survey of the field from the standpoint of practicability. The use of numerous tables and diagrams clarifies the text, and further study of the topics is suggested by the appending of literature references and bibliography lists to each chapter.

The book comprises 14 text chapters, a final chapter summing up the material presented, and both author and subject indices. Following the introduction, separate chapters are devoted to adsorption of gases and vapors by solids; adhesion and the effect of adsorption; active solids; films on the surfaces of liquids; interpretation of the adsorption isotherm; the external surface of a solid, including porosity, premeability, smoke, and dust; the electron microscope and electron diffraction as applied to surface problems; friction and lubrication; spreading of a liquid over a solid; adsorption from liquids, including chromatography; determining the specific surface area, surface energy, and density of a solid; catalysis and chemisorption; and the part played by the surface in chemical reactions.

"Statistical Methods for Chemists." W. J. Youden. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. Cloth, 5¾ by 9 inches, 136 pages. Price, $3.

Characterized by a complete lack of statistical theory and proofs, this book presents an excellent exposition of the modern statistical system of units for expressing scientific conclusions. Drawing from his own lengthy experience in both the chemical and statistical fields, the author presents the statistical techniques which he himself found most useful in a wide variety of scientific investigations. Written from the laboratory worker's point of view, the book presents examples taken from actual data obtained in real investigations, with explanations of the fundamental statistical principles which are behind these examples.

Introductory material has been held to a minimum because of the author's conviction that laboratory men have a real understanding of the meaning of their measurements, even though this understanding is usually inarticulate. Similarly, some topics usually included in statistics textbooks are either omitted entirely or else referred to only briefly because of their non-application to scientific experimentation. Subjects covered in the text include precision and accuracy; the measurement of precision; the comparison of averages; the resolution of errors; statistics of the straight line; the analysis of variance; interaction between factors; requirements for data; arrangements for improving precision; and experiments with several factors. Appendices include a bibliography; tables of critical values; and a subject index.

NEW PUBLICATIONS

Technical data sheets published by Monsanto Chemical Co., St. Louis 4, Mo. **"Santicizer 8—Use in Moldings."** 2 pages. **"Santicizer 8—Use in Adhesives."** 2 pages. **"Santicizer 8—Use in Coatings."** 2 pages. These data sheets provide typical formulations and other information on the use of Santicizer 8 plasticizer in cellulosic and polyamide moldings; polyvinyl acetate, cellulosic, polyamide, and shellac base adhesives; and cellulosic and protein type of coatings.

Publications of Columbia-Southern Chemical Corp., Fifth Ave. at Bellefield, Pittsburgh 13, Pa. **"The Mixing of Hi-Sil Loaded GR-S Compounds."** Pigment Data Bulletin No. 51-3, October, 1951. 4 pages. Laboratory test results show that the method of mixing Hi-Sil loaded GR-S stocks has little effect on the physical properties, except that prolonged mill mixing does give higher moduli. **"Calcene TM."** Pigment Data Bulletin No. 51-4, October, 1951. 2 pages. Properties and applications are given for Calcene TM, a fine particle size, precipitated calcium carbonate surface coated to increase ease of dispersion and wetting by elastomers.

"Du Pont Alamask Odorants for the Rubber Industry." E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del. 10 pages. Descriptions are given of 19 Alamask odorants, together with information as to their use in latex, dry rubber, and elastomeric plastics.

"Battelle." Battelle Memorial Institute, Columbus 1, O. 36 pages. This handsome illustrated booklet describes and discusses the persons and facilities that can be seen in a visit to the Institute. Individual sections are devoted to the staff members, supervisory personnel, and research teamwork; the laboratories and their facilities; and the Institute's fields of service, growth, and contributions to industry.

"ASTM Standards on Textile Materials (with Related Information)." American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. Paper, 6 by 9 inches, 611 pages. Price, $5. This new edition presents 88 specifications, test methods, and tolerances for textile materials, as developed by ASTM Committee D-13. In addition to the standards, there is a section of photomicrographs of common fibers and defects in woven fabrics; a glossary of textile terms; new tentative test methods for abrasion resistance of fabrics; and appendices covering basic properties of textile fibers, tables of relative humidity, yarn number conversion tables, and other related information.

"Annual Report, 1951." Armour Research Foundation of Illinois Institute of Technology, Chicago 16, Ill. 55 pages. This annual report of the Foundation's research program for 1950-1951, its fifteenth year of service, reviews the projects worked on in the fields of engineering mechanics, materials and processes, physics, and electrical engineering. An organizational chart is included, together with listings of administrative personnel and the board of trustees.

Bulletins of Raybestos-Manhattan, Inc., Manhattan Rubber Division, Passaic, N. J. **"Condor V-Belts."** Bulletin No. 6868-E. 4 pages. Constructional details and other features of these V-belts are described and illustrated in this bulletin. Interesting installations of these belts are discussed, and a table of standard industrial belt sizes is included. **"Ray-Man 'F' Conveyor Belt."** Bulletin No. 6915. 4 pages. Information is given on the construction and application of Ray-Man "F", a general purpose heavy duty conveyor belt for applications involving danger of tearing or puncture, use of small pulleys, added flexibility and better fastener life, and use of thick, narrow belts.

"German Books on Chemical & Cognate Subjects, Published 1939-1950." Second Edition. A. E. Cummins and S. Vince. Lange, Maxwell & Springer, Ltd., 41-45 Neal St., London W.C.2, England. 108 pages. As indicated by the title, this is a classified bibliography of German books on chemistry, metallurgy, mathematics, and physics. The title, author, number of pages, and German price are given for each book.

"Patents for Technical Personnel." Wirth Wade. Chemonomics, Inc., 400 Madison Ave., New York 17, N. Y. Paper, 6 by 9 inches, 40 pages. Price, $3. Intended as a reference manual on patents and inventions for technical workers and students, this book is a practical guide written in non-legal language. The book covers the steps to be taken in protecting an invention; patent interference and prosecution; a typical industrial patent department and its relation to the inventor and the company; and how to read a patent, including a systematic method for analyzing and checking a claim. Unusual features include the use of flow sheets to illustrate the steps in converting an idea to the patent application, and the inclusion of detailed instructions for preparing invention records.

"Sundex-41." Sun Oil Co., Philadelphia 3, Pa. 16 Sundex-41, a new process aid for cold rubber, is descri' this booklet. Detailed information, including formulatic tables of physical data, is given on both laboratory and fac scale mixing and milling runs of cold rubber stocks containi this petroleum base material.

"Large Elastic Deformations of Isotropic Materials. VII. Experiments on the Deformation of Rubber." R. S. Rivlin and D. W. Saunders. **"VIII. Strain Distribution around a Hole in a Sheet."** R. S. Rivlin and A. G. Thomas. British Rubber Producers' Research Association, 48 Tewin Rd., Welwyn Garden City, Herts., England. Publication No. 147. 48 pages. In Part VII, measurements on suitable test pieces of a pure gum natural rubber vulcanizate are used to calculate the stored-energy function of the vulcanizate. This function is then used to predict the load-deformation relations for other forms of test pieces. In Part VII, the deformation produced by radial forces in a thin circular sheet of incompressible highly elastic material containing a central hole is studied theoretically. Results calculated on the basis of this theory are compared with those obtained experimentally by using a vulcanized natural rubber compound as the highly elastic material.

"Midco-B in a Tread Compound with Various Types of GR-S." Report No. 15. Midwest Rubber Reclaiming Co., East St. Louis, Mo. 4 pages. Extensive laboratory test data are presented on the properties obtained with two proportions of Midco-B, a whole tire reclaim, in tread stocks based on GR-S, GR-S-10, GR-S-100, and GR-S X-628.

"A Year Book of Railroad Information." 1951 edition. Eastern Railroad Presidents Conference Committee on Public Relations, 143 Liberty St., New York 6, N. Y. 96 pages. **"Automobile Transportation in Defense or War."** United States Defense Transport Administration, Washington, D. C. 68 pages. **"Principles of Good Source Relations."** Personal Products Corp., Milltown, N. J. 10 pages. Publications of Underwriters' Laboratories, Inc., 207 E. Ohio St., Chicago 11, Ill. **"Accident, Automotive, and Burglary Protection Equipment Lists."** September, 1951. 114 pages. **"Bi-Monthly Supplement to All Lists."** August, 1951. 88 pages.

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Merry Christmas!

SEE PAGE 264

MARKET REVIEWS

CRUDE RUBBER

SOME rubber price declines in the foreign markets during the period from October 16 to November 15 brought the government into the market for moderate to heavy stockpile buying. Since the price for No. 1 smoked sheets was still above the 48¢ a pound level deemed satisfactory by the government, most of the purchasing was concentrated in the off-grade rubbers.

Government refusal to purchase high priced rubber has resulted in decreased supplies to domestic consumers. GSA is reported to be thoroughly screening all manufacturers' orders in accordance with the 90-day inventory limitation provision of Order M-2. Screening began with November orders, and it is reported that many orders were either reduced or refused. The screening is said to be affecting orders for grades down to No. 3 ambers.

The NPA will defer until at least April its announced plan for loosening the tight controls on domestic consumption of natural rubber. Manufacturers are now permitted to use 100% of their consumption in the base-period year ending June 30, 1950, except for automobile tires and certain other products, where a 90% consumption is allowed. The NPA had planned to allocate natural and synthetic rubber, starting January 1, 1952, on the basis of each consumer's requests, but a survey of the industry indicated such requests would be in excess of available supplies. It was indicated that first quarter, 1952, restrictions may be relaxed to the extent of permitting manufacturers to produce second-line auto tires.

Although reiterating its intention of returning the purchasing of natural rubber to private industry, GSA has given no indication as yet as to when this plan may be accomplished. Private estimates are that this change-over will not take place until the third quarter of next year, at the earliest. Meanwhile the GSA selling price of 52¢ a pound for No. 1 sheets was continued through December.

Latices

AFTER reports circulated of the imminency of such action for a month or more, GSA finally announced November 19 that it will give up its exclusive purchasing authority over *Hevea* latex "as soon as necessary details can be worked out." Because of the need of liquidation of present government stocks, no date can be set as yet when this purchasing power can be turned back to private industry by the government.

The change-over is reported to be in agreement with recommendations made in December, 1950, by the latex industry advisory committee. The method of liquidating present stocks is still to be worked out, but it is believed that GSA will still purchase and import some latex during the first quarter of 1952 in order to balance out stocks. Indications are that private purchasing of *Hevea* latex will not commence until the second quarter of next year.

The November and December GSA selling price for bulk *Hevea* latex remained unchanged at 64¢ a pound, dry weight. Domestic imports for August are estimated at 4,529 long tons, dry weight; consumption, 3,360 long tons; and month-end industry stocks, 5,780 long tons. Estimates for September show imports of 2,200 long tons, dry weight; consumption, 3,500 long tons; and month-end industry stocks, 5,300 long tons.

GR-S latex prices were continued by GSA through December at 26¢ a pound, dry weight, for low solids latex, and 27.75¢ a pound for high solids types. August production of GR-S latex was 2,499 long tons, dry weight; imports, 138 long tons; consumption, 2,538 long tons; and month-end stocks, 3,467 long tons. Production for September and October is estimated at 2,700 long tons, dry weight, each month.

SCRAP RUBBER

SCRAP rubber market activity was dull until the end of the period from October 16 to November 15, when the onset of winter weather served to cut down scrap collections and reduce supplies. The high freight rates also continued to affect supplies, and smaller collectors in some sections of the country were reported to have given up scrap rubber in favor of other and more profitable scrap materials.

Toward the end of the period reclaimers were reported to be taking moderate quantities of scrap tires and tire parts, but the scrap tube market was very soft. Some tube sales were said to be taking place at prices lower than the quoted levels. While some eastern dealers reported small shipments of scrap rubber abroad, export business was viewed as slight.

Following are dealers' selling prices for scrap rubber, in carload lots, delivered to mills at the points indicated:

	Eastern Points	Akron, O.
	(Per Net Ton)	
Mixed auto tires	$20.00	$20.00
Peelings, No. 1	55.00	58.00
3	27.00	29.00
[illegible]		
[illegible]	(¢ per Lb.)	
Black inner tubes	7.0	7.25
Red passenger tubes	10.00	10.25

RECLAIMED RUBBER

THE reclaimed rubber market showed no new developments during the period from October 16 to November 15. The improvement in reclaim sales first evident late in September continued throughout the market period, and November sales were expected to approximate the October level.

Final August and preliminary September figures on the domestic reclaimed rubber industry are now available. Final August statistics show a production of 29,035 long tons; imports, 140 long tons; consumption, 28,598 long tons; exports, 991 long tons; and month-end stocks, 43,900 long tons. Preliminary figures for September give a production of 26,863 long tons; consumption, 26,615 long tons; exports, 1,347 long tons; and month-end stocks, 43,658 long tons.

There were no changes in reclaimed rubber prices during the market period. In general, prices were at the ceiling levels given in CPR 58 and listed in our September issue, page 756.

COTTON AND FABRICS

NEW YORK COTTON EXCHANGE
WEEK-END CLOSING PRICES

Futures	Aug. 25	Sept. 29	Oct. 20	Oct. 27	Nov. 3	Nov. 10
Mar.	34.92	36.47	36.76	37.45	39.18	41.70
May	34.89	36.48	36.64	37.23	38.86	41.40
July	34.49	35.93	36.18	36.73	38.22	41.09
Oct.	33.28	34.82	35.01	35.50	36.78	39.04
Dec.	33.16	34.80	34.98	35.40	36.60	38.74
Mar.	....	34.65	34.88	35.34	36.52	38.72

COTTON spot and futures prices on the New York Cotton Exchange continued to rise during the period from October 16 to November 15. The advance, originally based on a withholding movement by cotton growers, was given sharp impetus by the crop estimate issued November 8 by the United States Department of Agriculture, which was about 1,000,000 bales below expectations. This estimate placed the crop at 15,771,000 bales, as compared with the October 1 estimate of 16,931,000 bales. In view of seasonal exports, which are expected to reach or exceed 6,000,000 bales, and a domestic consumption of about 10,000,000 this crop would leave a carry-over of about 2,000,000 bales at the end of the season. On the basis of this crop estimate, there is some possibility of the reimposition of quantitative export controls on cotton by the government.

The spot price for middling 15/16-inch cotton started the period at 38.25¢, dropped back to a low of 36.85¢ on October 19, and then began a rise that resulted in a high of 44.65¢ on November 9 and a closing price of 43.20¢ on November 15. Futures prices moved correspondingly, with December futures going from 37.22¢ on October 16 to a high of 43.73¢ on November 9 before ending the period at 42.40¢.

Fabrics

Industrial cotton fabric mills were caught in a price squeeze as a result of the sharp advance in cotton market prices during the period under review. Most mills withdrew from the market while attempting to arrive at some sort of uniform pricing on their cloth lines. These revised prices will depend on where raw material costs will stabilize, and continuing or even higher cotton prices will bring rises in fabric prices. At the same time, most mills were understandably reluctant to raise their prices in view of the slow demand for goods. As the result of mill withdrawal from the market, many of the fabric prices listed in the table below are expected to undergo drastic revision as soon as new prices can be computed.

Cotton Fabrics

Drills

59-inch 1.85-yd. ... yd.	$0.375	/	$0.40
2.25-yd.	.32	/	.3375

Ducks

38-inch 1.78-yd. S. F. ... yd.	.615
2.00-yd. D. F. ... yd.	.38
51.5-inch, 1.35-yd, S. F.	.5475
Hose and belting	.76

Osnaburgs

40-inch 2.11-yd. ... yd.	.29	/	.30
3.65-yd. ... yd.	.185	/	.19

Raincoat Fabrics

Print cloth, 38½-inch, 64x60	.16	/	.165
Sheeting, 48-inch, 4.17-yd	.2225		
52-inch 3.85-yd	.24		

Chafer Fabrics

14-oz./sq. yd. Pl. ... lb.	.81	/	.82
11.65-oz./sq. yd. S.	.74		
10.80-oz./sq. yd. S.	.7775	/	.78
8.9-oz./sq. yd. S.	.79	/	.795

Other Fabrics

Headlining, 68-inch 1.35-yd., 2-ply ... yd.	nom.
64-inch, 1.25-yd. 2-ply	.66
Sateens, 53-inch 1.32-yd.	.65
58-inch 1.21-yd.	.7175

Tire Cords

K. P. std., 12-3-3 ... lb.	nom.
12-4-2	.82

RAYON

TOTAL October rayon shipments by United States producers to domestic consumers amounted to 82,200,000 pounds. Of this total, 30,000,000 pounds were of viscose high-tenacity yarn, an increase of 5.7% over the preceding month's figure. The calculated monthly production of high-tenacity yarn for October was 30,300,000 pounds, about 7% above estimated production in September. End-October stocks of the yarn were 2,200,000 pounds.

Third-quarter production of viscose high-tenacity yarn totaled 86,600,000 pounds, an increase of 5,400,000 pounds over the second-quarter figure and 6,400,000 pounds over the total for the first quarter.

High-tenacity yarn shipments for tires and related uses during the third quarter amounted to 83,000,000 pounds, or 6,700,000 pounds above second-quarter shipments. The average denier of these shipments during the third quarter was 1573, as compared with 1571 in the second quarter and 1568 in the first quarter. Of the third-quarter shipments, the percentages of the principal denier groups were as follows: 1100 denier, 14%; 1650 denier, 78%; and 2200 denier, 8%.

No changes were made in rayon tire yarn and fabric prices during the period from October 16 to November 15, and current prices follow:

Rayon Prices

Tire Fabrics

1100/490/2		$0.72
1650/980/2	$0.695/	.73
2200/980/2		.685

Tire Yarns

1100/ 480	0.62/	.63
1100/ 490		.62
1150/ 490		.62
1650/ 720	.61/	.62
1650/ 980		.61
1900/ 980		.61
2200/ 960		.61
2200/ 980		.60
4400/2934		.63

U. S. Imports, Exports, and Reexports of Crude and Manufactured Rubber

Imports for Consumption of Crude and Manufactured Rubber

	July, 1951 Quantity	July, 1951 Value
UNMANUFACTURED, Lbs.		
Crude rubber	151,225,646	$78,807,699
Latex	12,587,11	8,522,995
Crude chicle	446,118	300,180
Guayule	345,200	99,482
Balata	257,014	94,073
Jelutong or Pontianak	432,713	308,222
Gutta percha	51,520	32,106
Synthetic rubber	1,154,219	323,602
Reclaimed rubber	674,608	303,192
Scrap rubber	4,470,796	353,424
TOTALS	171,644,946	$89,144,975
MANUFACTURED		
Tires and casings		
Auto, etc. ... no.	5,392	$165,624
Bicycle ... no.	1,406	1,810
Other ... no.	95	11,431
Inner tubes: auto, etc. no.	236	1,004
Rubber footwear		
Boots ... prs.	8,211	11,173
Shoes and overshoes prs.	6,610	4,340
Rubber-soled canvas shoes ... prs.	3,246	2,853
Athletic balls: golf ... no.	156,106	49,638
Tennis ... no.	23,616	6,042
Other ... no.	47,077	6,107
Rubber toys, except balloons	......	21,833
Hard rubber goods		
Combs ... no.	71,265	8,007
Other	......	125,524
Rubberized printing blankets ... lbs.	335	960
Rubber and cotton packing ... lbs.	1,746	2,540
Gaskets and valve packing	......	9,732
Molded insulators	......	274
Hose and tubing	......	37,651
Belting ... lbs.	10,863	15,691
Drug sundries	......	26,613
Instruments ... doz.	5,471	6,101
Other rubber products	......	3
Gutta percha manufactures ... lbs.	3,122	3,473
Rubber bands ... lbs.	41,000	39,045
Synthetic rubber products	......	2,648
Other soft rubber goods	......	108,324
TOTALS	......	$668,441
GRAND TOTALS, ALL RUBBER IMPORTS	......	$89,813,415

Exports of Domestic Merchandise

	July, 1951 Quantity	July, 1951 Value
UNMANUFACTURED, Lbs.		
Crude rubber	7,680	$8,607
Chicle and chewing gum bases	483,767	226,469
Balata	2,840	4,452
Synthetic rubbers		
GR-S types	243,977	56,765
Neoprene	1,527,074	624,042
Nitrile types	390,693	182,061
Poluisobutylene	4,290	1,279
Others, except butyl and "Thiokol"	1,175	3,284
Reclaimed rubber	2,328,925	212,340
Scrap rubber	3,928,590	254,769
TOTALS	8,919,011	$1,574,068
MANUFACTURED		
Rubber cement ... gals.	82,916	$154,215
Rubberized fabric		
Auto cloth ... sq. yds.	6,071	9,390
Piece goods and hospital sheeting ... sq. yds.	99,299	78,810
Rubber footwear		
Boots ... prs.	12,989	59,290
Shoes ... prs.	7,688	14,929
Rubber-soled canvas shoes ... prs.	8,180	17,810
Soles ... doz. prs.	19,328	60,437
Heels ... doz. prs.	56,086	68,538
Soling and toplift sheets ... lbs.	423,466	92,349
Gloves and mittens ... doz. prs.	16,977	68,525
Drug sundries		
Water bottles and fountain syringes ... no.	18,266	16,445
Other	......	227,531
And rubberized clothing	......	106,628
Toy and novelty balloons	......	15,167
Toys and balls	......	32,825
Erasers, except pencil ... lbs.	18,187	14,847
Hard rubber goods		
Battery boxes ... no.	$14,456	$32,787
Other electrical goods ... lbs.	107,220	72,730
Combs, finished ... doz.	2,118	2,494
Other	......	14,581
Tires and casings		
Truck and bus ... no.	61,337	3,198,825
Auto ... no.	46,411	785,773
Aircraft	......	123,622
Farm tractor, etc. ... no.	7,767	245,987
Other-off-the-road ... no.	5,045	832,772
Bicycle ... no.	9,287	13,891
Motorcycle ... no.	1,597	9,670
Other ... no.	2,948	48,628
Inner tubes: auto ... no.	33,106	85,650
Truck and bus ... no.	24,097	109,904
Aircraft ... no.	1,146	6,487
Other ... no.	9,812	42,501
Solid tires: truck and industrial ... no.	2,148	50,667
Tire repair material		
Camelback ... lbs.	378,552	130,241
Other ... lbs.	267,698	246,492
Rubber and friction tape ... lbs.	47,895	43,464
Belting: auto and home ... lbs.	102,011	148,637
Transmission		
V-belts ... lbs.	142,237	316,091
Flat belts ... lbs.	65,269	105,419
Other ... lbs.	63,878	101,677
Conveyer and levitator ... lbs.	306,495	340,493
Hose and tubing ... lbs.	597,890	553,190
Packing ... lbs.	148,017	176,821
Mats, flooring, tiling lbs.	266,528	78,868
Thread: bare ... lbs.	21,091	33,615
Textile covered ... lbs.	23,660	84,965
Gutta percha manufactures ... lbs.	8,038	4,200
Compounded latex and other rubber for further manufacture ... lbs.	301,851	184,906
Other natural and synthetic rubber manufactures	......	453,232
TOTALS	......	$9,710,016
GRAND TOTALS, ALL RUBBER EXPORTS	......	$11,284,084

Reexports of Foreign Merchandise

	July, 1951 Quantity	July, 1951 Value
UNMANUFACTURED, Lbs.		
Balata	6,834	$3,464
Jelutong and gutta percha	560	840
Buna S synthetic rubber	2,710	1,183
Scrap rubber	6,608	1,586
TOTALS	16,712	$7,073
MANUFACTURED		
Rubber boots ... prs.	252	$1,112
Drug sundries	......	345
Balloons	......	127
Toys and balls	......	2,246
Solid tires: truck and industrial ... no.	9	446
Rubber packing ... lbs.	40	100
Other natural and synthetic rubber manufactures	......	304
TOTALS	......	$4,680
GRAND TOTALS, ALL RUBBER REEXPORTS	......	$11,753

SOURCE: Bureau of Census, United States Department of Commerce, Washington, D. C.

Trade Lists Available

The Commercial Intelligence Division, United States Department of Commerce, Washington, D. C., recently published the following trade lists, of which mimeographed copies may be obtained by firms domiciled in the United States, from this Division, and from Department of Commerce Field Offices. The price is $1 a list for each country.

Aircraft & Aeronautical Supply & Equipment Importers and Dealers—Brazil, Ecuador.

Automotive Product Manufacturers—France.

Electrical Supply & Equipment Importers & Dealers—Japan.

Rubber Goods Manufacturers—Western Germany.

CLASSIFIED ADVERTISEMENTS

ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE

Effective July 1, 1947

GENERAL RATES	SITUATIONS WANTED RATES	SITUATIONS OPEN RATES
Light face type $1.25 per line (ten words)	Light face type 40c per line (ten words)	Light face type $1.00 per line (ten words)
Bold face type $1.60 per line (eight words)	Bold face type 55c per line (eight words)	Bold face type $1.40 per line (eight words)
Allow nine words for keyed address.		*Letter replies forwarded without charge, but no packages or samples.*

Address All Replies to New York Office at 386 Fourth Avenue, New York 16, N. Y.

SITUATION WANTED

CHEMIST—COMPOUNDER—WITH 20 YEARS' EXPERIENCE. Compounding, Process and Factory Engineering, chief chemist small and large companies. Tires, molded goods, sheeting, coated fabrics, and many other products. Address Box No. 919, care of INDIA RUBBER WORLD.

SITUATIONS OPEN

WELL-ESTABLISHED EXPANDING MANUFACTURER OF HARD rubber and plastic molded products in Trenton, New Jersey, has openings for the following technical personnel:

ANALYTICAL CHEMIST—to establish inorganic testing procedures, gravimetric and volumetric, and assume responsibilities for supervising analytical testing unit.

CONTROL CHEMIST—to test and follow up raw materials in-process batches and finish-product quality. Should have ability to deal with people.

DEVELOPMENT CHEMIST—to do development and pilot-plant work on rubber and plastic products. Should be capable of original thinking and practical application.

These positions are permanent and offer excellent opportunities for advancement. Young men with the ability to grow are preferred. Please submit résumé including education, experience, salary requirement. Address Box No. 920, care of INDIA RUBBER WORLD.

SPONGE RUBBER CHEMIST—EXCELLENT OPPORTUNITY for man with experience and ambition. Permanent position with established firm located in Pennsylvania. Salary open. Submit detailed résumé of business experience and personal qualifications first letter. Address Box No. 921, care of INDIA RUBBER WORLD.

ADHESIVE CHEMIST—EXPERIENCE IN RECLAIMS, SYNTHETICS and resins desired. Position is with expanding adhesive company in Midwest. Salary commensurate with ability. All replies will be held confidential. Write giving full résumé to Box No. 922, care of INDIA RUBBER WORLD.

RUBBER TECHNICIAN: EXPERIENCED IN FLAT BELTING OR hose. Prefer man with good knowledge of use of synthetic fibers in these products. Excellent opportunity with established firm in New Jersey. Reply stating educational and experience background, with starting salary. Address Box No. 923, care of INDIA RUBBER WORLD.

RUBBER CHEMIST: WITH EXPERIENCE, TO CARRY ON INdependent compounding for flat belting, hose, and packing. Excellent opportunity with old, well-established manufacturer located in New Jersey. State age, technical background, experience, and salary requirements in first letter. Address Box No. 924, care of INDIA RUBBER WORLD.

CABLE DESIGN ENGINEER

Electrical engineer experienced with specifications, design development, and production of insulated wire and cable. Write giving details on education, experience, and salary to Box No. 925, care of INDIA RUBBER WORLD.

RUBBER TECHNOLOGIST—CHEMIST OR CHEMICAL ENGINEER. Large Eastern supplier has opening for permanent position in its Rubber Laboratory for recent college graduate with up to five years' industrial experience in mechanical goods, sundries, wire, tires, or latex. Practical experience in factory processing and compounding essential so that laboratory results can be readily interpreted and demonstrated to customers. Position offers excellent opportunities for advancement in either sales or development compounding. Progressive management encourages publication of experimental work. This, coupled with laboratory having finest equipment and staffed with highest type of trained technicians, assures successful applicant of ample opportunity to demonstrate ingenuity and ability. Position also offers opportunity for some travel and for contacts with the rubber industry. Write, giving full details, age, education, and experience. Replies held strictly confidential. Our employes know of this ad. Address Box No. 926, care of INDIA RUBBER WORLD.

WANTED: PLANT MANAGER EXPERIENCED IN ALL PHASES of molded and extruded rubber, including rolls, etc. Must be able to figure quotes on inquiries. Wonderful opportunity for right man in small plant with steady growth for past several years. Give age, experience, and other information. Address Box No. 927, care of INDIA RUBBER WORLD.

MAN UNDER 40 WITH EXPERIENCE IN RUBBER & SYNTHETICS to be chemist in charge of laboratory of small but progressive & well-established manufacturer of molded products and specialties. Must be capable of developing new formulations & improving present ones. Fine opportunity for right man. All replies held strictly confidential. Address Box No. 933, care of INDIA RUBBER WORLD.

RUBBER TECHNOLOGIST. WANTED FOR TECHNICAL WORK involving writing and liaison in the general field of rubber. About five years' broad experience desirable. Interesting opportunity in Southwest. Our employes know of this advertisement. Apply to P. O. Box 2296, San Antonio 6, Texas.

CHEMIST OR CHEMICAL ENGINEERS

Recent graduates for training program, associated with polymer chemistry. Give complete details in first letter. Plant located in central New Jersey. Address Box No. 939, care of INDIA RUBBER WORLD.

SITUATIONS OPEN (Continued)

WANTED: A COMPOUNDER EXPERIENCED IN SHOE Factory Products other than adhesives, either on full-time or consulting basis, mid-western location. Medium-sized growing organization. Address Box No. 940, care of INDIA RUBBER WORLD.

WANTED

TWO MEN enough interested in "Tomorrow" to answer this advertisement "Today."

It's strictly against the policy of this midwest industrial rubber products manufacturer to go outside its own organization for executive personnel, but a new plant addition for the manufacturing of wire-braid, lead press hose makes this move necessary.

We need two men to head up this program.

an

EXPERIENCED CHEMIST

and a

HOSE DEPARTMENT SUPERINTENDENT

The men selected must have had considerable experience in the production of wire-braid, lead press hose, plus the ability to start from scratch with a new building and new equipment to build a high quality product.

If you qualify for either of these positions . . . and want to build a future in a medium-size midwestern city . . . write us now. Give us full facts about your experience, age, education and salary requirements.

Box 934, c/o INDIA RUBBER WORLD.

CHEMICAL ENGINEER

Man with latex dip experience. Capable of developing compounds and equipment for continuous latex dip coating. Unusual opportunity for man with initiative and ability to develop new product for well established AAA-1 company. Permanent position. Location Southern New England.

Address Box 918, c/o India RUBBER WORLD

Where Needs Are Filled

The Classified Ad Columns of INDIA RUBBER WORLD bring prompt results at low cost.

(Classified Advertisements Continued on Page 383)

COMPOUNDING INGREDIENTS*

Abrasives

Pumicestone, powdered	lb.	$0.025	$0.055
Rottenstone, domestic	ton	40.00	48.00

Accelerators, Organic

A-10	lb.	.40	.47
A-19	lb.	.52	.58
A-32	lb.	.59	.69
A-77	lb.	.47	.60
A-100	lb.	.47	.60
Accelerator 8	lb.	.98	
49	lb.	.48	.49
552	lb.	2.00	
808	lb.	.59	.61
833	lb.	1.13	1.15
Altax	lb.	.42	.44
Rodform	lb.	.425	.44
Amax	lb.	1.00	
Arazate	lb.	2.16	
Beutene	lb.	.59	.64
B-J-F	lb.	.27	.32
Butasan	lb.	1.00	
Butazate	lb.	1.00	
Butyl Eight	lb.	1.10	1.35
Zimate	lb.	1.00	
Captax	lb.	.34	.36
C-P-B	lb.	1.95	
Cumate	lb.	1.45	
Cuprax	lb.	.60	.62
Diesterex N	lb.	.50	.57
DOTG(diorthotolyguanidine)	lb.	.52	.53
DPG (diphenylguanidine)	lb.	.42	.45
El-Sixty	lb.	.61	.68
Ethasan	lb.	1.00	
Ethazate	lb.	1.00	
Ethex	lb.	1.00	
Ethyl Tuads	lb.	1.00	
Zimate	lb.	1.00	
Ethylac	lb.	.88	.90
Good-rite Erie	lb.	.35	.37
Hepteen	lb.	.42	.48
Base	lb.	1.80	1.90
Ledate	lb.	1.00	
M-B-T	lb.	.34	.39
-XXX	lb.	.46	.48
M-B-T-S	lb.	.42	.47
Pellets	lb.	.425	.445
Mertax	lb.	.50	.57
Methesan	lb.	1.00	
Methazate	lb.	1.00	
Methyl Tuads	lb.	1.10	
Zimate	lb.	1.00	
Monex	lb.	1.10	
Mono-Thiurad	lb.	1.10	
Morfex	lb.	.59	.64
O-X-A-F	lb.	.43	.48
Pentex	lb.	1.00	
Flour	lb.	.20	
Phenex	lb.	.49	.54
Pipazate	lb.	1.53	
Rodform products	lb.	1.00	3.00
Rotax	lb.	.44	.46
S. A. 52	lb.	1.10	
57, 62, 67, 77	lb.	1.00	
66	lb.	1.45	
Safex	lb.	1.15	
Santocure	lb.	.68	.75
Selazate	lb.	1.45	
Selenac	lb.	1.45	
SPDX-GH	lb.	.64	.69
Tellurac	lb.	1.45	
Tepidone	lb.	.55	
Tetrone A	lb.	1.85	
Thiofide	lb.	.42	.49
S	lb.	.465	.535
Thionex	lb.	1.10	
Thiotax	lb.	.34	.41
Thiurad	lb.	1.10	
Thiuram E	lb.	1.00	
M	lb.	1.10	
Trimene	lb.	.54	.64
Base	lb.	1.03	1.18
Tuex	lb.	1.10	
2-MT	lb.	.75	
Ultex	lb.	1.00	1.10
Ureka Base	lb.	.66	.73
Z-B-X	lb.	2.45	
Zenite	lb.	.42	.44
A	lb.	.50	.52
Special	lb.	.43	.45
Zetax	lb.	.43	.45

Accelerator-Activators, Inorganic

Lime hydrated	ton	9.00	16.00
Litharge, comml.	lb.	.21	.22
Eagle, sublimed	lb.	.2165	.2175
National Lead	lb.	.2165	.2175
Red Lead, comml.	lb.	.2155	.248
Eagle	lb.	.2275	
National Lead	lb.	.2255	
White lead, basic	lb.	.201	.211
Eagle. National Lead	lb.	.201	.2111
White lead, silicate	lb.	.1715	.2375
Eagle	lb.	.2204	.2371
National Lead	lb.	.1715	.1815
Zinc oxide, comml.†	lb.	.176	.2085

Accelerator-Activators, Organic

Aktone	lb.	.22	.23
Barak	lb.	.60	
Curade	lb.	$0.57	$0.59
D-B-A	lb.	1.95	
Delac P	lb.	.45	.52
Emersol 110	lb.	.12	.1325
120	lb.	.125	.1375
130	lb.	.1475	.16
210 Elaine	lb.	.125	.1525
Emery 600	lb.	.105	.1325
Guantal	lb.	.55	.62
Hyfac 430	lb.	.1775	.19
431	lb.	.1875	.20
Laurex	lb.	.29	.32
MODX-B	lb.	.295	.345
NA-22	lb.	1.50	
Palmalene	lb.	.35	
Plastone	lb.	.27	.30
Polyac	lb.	1.60	
Ridacto	lb.	.25	.26
Seedine	lb.	.1485	.1705
SOAC-KL	lb.	.065	.09
Stearex Beads	lb.	.14⅞	.15⅞
Stearic acid, single pressed	lb.	.12	.1325
Double pressed	lb.	.125	.1375
Triple pressed	lb.	.1475	.16
Stearite	lb.	.095	.10
Tonox	lb.	.50	.59
Zinc stearate	lb.	.41	.43

Alkalies

Caustic soda, flake	100 lbs.	3.75	6.77
Liquid, 50%	100 lbs.	2.55	2.75
Solid	100 lbs.	3.35	5.05

Antioxidants

AgeRite Alba	lb.	2.20	2.30
Gel	lb.	.60	.62
H.P.	lb.	.67	.69
Hipar	lb.	.91	.93
Powder	lb.	.49	.51
Resin	lb.	.65	.67
D	lb.	.49	.51
Stalite	lb.	.49	.51
White	lb.	1.40	1.50
Akroflex C, F	lb.	.67	.69
Albasan	lb.	.69	.73
Aminox	lb.	.49	.58
Antioxidant 2246	lb.	1.60	1.63
Antisol	lb.	.23	.24
Antox	lb.	.49	.51
Aranox	lb.	3.25	
Betanox Special	lb.	.70	.79
B-L-E, -25	lb.	.49	.58
Burgess Antisun Wax	lb.	.21	
B-X-A	lb.	.43	.52
Copper Inhibiter X-872-L	lb.	1.95	
Flectol H	lb.	.49	.56
Flexamine	lb.	.67	.76
Heliozone	lb.	.25	.26
Ionol	lb.	.91	1.40
NBC	lb.	1.50	
Neozone A	lb.	.51	.53
C	lb.	.67	
D	lb.	.45	.51
Perflectol	lb.	.61	.68
Permalux	lb.	1.85	
Rio Resin	lb.	.52	.54
Santoflex 35	lb.	.67	.74
AW	lb.	.75	.82
B	lb.	.49	.56
BX	lb.	.60	.67
Santovar A	lb.	1.50	1.57
O	lb.	1.30	1.37
Santowhite Crystals	lb.	1.55	1.62
L	lb.	.49	.56
MK	lb.	1.25	1.32
S.C.R.	lb.	.32	.34
Sharples Wax	lb.	.23	.28
Stabilite	lb.	.53	.57
Alba	lb.	.72	.79
L	lb.	.60	.64
White	lb.	.53	.62
Powder	lb.	.41	.47
Sunolite	lb.	.20	
Sunproof	lb.	.25	.30
Improved	lb.	.23	.28
Jr.	lb.	.18	.23
Thermoflex A	lb.	.98	1.00
Tonox	lb.	.50	.5975
Tysonite	lb.	.24	.24
V-G-B	lb.	.65	.74
Wing-Stay S	lb.	.49	.58
Zenite	lb.	.33	.35

Antiseptics

Copper naphthenate, 6-8%	lb.	.2475	
Pentachlorophenol	lb.	.21	.29
Resorcinol, technical	lb.	.825	.835
Zinc naphthenate, 8-10%	lb.	.24	.2925

Blowing Agents

Ammonium, bicarbonate	lb.	.055	.06
Carbonate	lb.	.23	.24
Sodium bicarbonate	100 lbs.	$2.10	$3.15
Carbonate, technical	100 lbs.	1.20	5.02
Unicel	lb.	.82	
ND	lb.	1.40	
S	lb.	.20	

*Prices in general are f.o.b. works. Range indicates grade or quantity variations. Space limitation prevents listing of all known ingredients. Prices are not guaranteed; contact suppliers for spot prices.

†For trade names, see Color—White, Zinc Oxide.

Bonding Agents

BAC Latex	lb.	.75	.80
G-E Silicone Paste SS-15	lb.	4.52	5.10
SS-64	lb.	3.65	6.75
-67 Primer	lb.	7.50	12.50
MDI-50	lb.	2.75	3.25
Thixons	gal.	1.48	12.00
Ty-Ply BN, Q. S., 3640	gal.	6.75	8.00

Brake Lining Saturants

B.R.T. No. 3	lb.	.024	.025
Resinex L-S	lb.	.0225	.03

Carbon Blacks

Conductive Channel—CC

Continental R-20, -40	lb.	.15	.22
Kosmos/Dixie BB	lb.	.18	.215
Spheron C	lb.	.14	.185
N	lb.	.25	.30
Voltex	lb.	.18	.315

Easy Processing Channel—EPC

Continental AA	lb.	.069	.1175
Kosmobile 77/Dixiedensed 77	lb.	.069	.1175
Micronex W-6	lb.	.07	.1225
Spheron #9	lb.	.074	.1225
Texas E	lb.	.07	.1175
Witco #12	lb.	.069	.1175
Wyex	lb.	.07	.12

Hard Processing Channel—HPC

Continental F	lb.	.069	.1175
HX	lb.	.074	.12
Kosmobile S/Dixiedensed S	lb.	.069	.1175
Micronex Mk. II	lb.	.07	.1225
Spheron #4	lb.	.074	.1225
Witco #6	lb.	.069	.1175

Medium Processing Channel—MPC

Arrow TX	lb.	.07	.12
Continental A	lb.	.069	.1175
Kosmobile S-66/Dixiedensed S-66	lb.	.069	.1175
Micronex Standard	lb.	.07	.1225
Spheron #6	lb.	.074	.1225
Texas M	lb.	.07	.1175
Witco #1	lb.	.069	.1175

Conductive Furnace—CF

Statex A	lb.	.08	.10

Fast Extruding Furnace—FEF

Statex M	lb.	.0575	.10
Sterling SO	lb.	.06	.10

Fine Furnace—FF

Statex B	lb.	.0625	.105
Sterling 99	lb.	.065	.105

High Abrasion Furnace—HAF

Aromex	lb.	.075	.125
Kosmos 60/Dixie 60	lb.	.074	.1125
Philblack O	lb.	.075	.119
Statex R	lb.	.075	.125
Vulcan #3	lb.	.079	.122

Medium Abrasion Furnace—MAF

Philblack A	lb.	.0575	.10

General Purpose Furnace—GPF

Sterling V	lb.	.05	.09

High Modulus Furnace—HMF

Continex HMF	lb.	.05	.09
Kosmos 40/Dixie 40	lb.	.05	.09
50/Dixie 50	lb.	.055	.095
Modulex	lb.	.0525	.095
Statex 93	lb.	.0525	.095
Sterling L	lb.	.055	.095

Semi-Reinforcing Furnace—SRF

Continex SRF	lb.	.035	.075
Essex	lb.	.0375	.08
Furnex	lb.	.0375	.08
Gastex	lb.	.045	.085
Kosmos 20/Dixie 20	lb.	.035	.075
Pelletex	lb.	.04	.08
Sterling NS, S	lb.	.04	.08

Very Fine Furnace—VFF

Statex K	lb.	.075	.125

Fine Thermal—FT

P-33	lb.	.055	

Medium Thermal—MT

Thermax	lb.	.035	
Stainless	lb.	.045	

Chemical Stabilizers

Advastab -21	lb.	1.06	1.12
Argus Stabilizers	lb.	.60	1.10

CLASSIFIED ADVERTISEMENTS

Continued

MACHINERY AND SUPPLIES FOR SALE

FOR SALE: 2—BANBURY MIXERS, #3 AND #3A. 1—BIRDSboro 1,000-ton Press, down-stroke ram. 1—16" x 42" Mill with drive & 75 h.p. motor; 1—Royle #4 Tuber, stainless steel screw and liner; 1—Elmes 37 x 37, 10-opening Hydraulic Press, 30" ram. Send us your inquiries. CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York 38, N. Y.

FOR SALE—20 TONS CARBON BLACK, HARD CHANNEL, WITH accelerator — .04 lb. f.o.b. New York. CHEMICAL SERVICE CORP., 80 Beaver St., New York 5, N. Y.

SZEGVARI #100 ATTRITOR WITH 7½ H.P. EXPLOSION-PROOF motor, flint pebble charge, and extra #60 equipment. Brand new machine, never used. Szegvari #1 laboratory model attritor with ¼ h.p. explosion-proof motor, and flint pebble charge. Nearly new machine. FARLEY & LOETSCHER MFG. CO., Dubuque, Iowa.

CANVAS AND RUBBER FOOTWEAR AND NATURAL-COLOR stationery rubber bands for sale any quantity, any size or made to specification. FUNG KEONG RUBBER MANUFACTORY, LIMITED, P. O. Box 100, Kuala Lumpur, Malaya.

FOR SALE: BANBURY MIXERS, MILLS, CALENDERS, LABOratory Mill and Banbury Unit, Extruders, Tubers, Hydraulic Presses. Send for detailed bulletin. EAGLE INDUSTRIES, INC., 110 Washington Street, New York 6, N. Y. DIGBY 4-8364-5-6.

FOR SALE: 25 HYDRAULIC PRESSES, ASS'T SIZES; 2 WORTHington Triplex Vertical High-Pressure Hydraulic Pumps and motors; 2 Trenchmarine 2-stage rotary pumps and motors; 1—4' x 8' 200-lb. pressure air receiving tank; 1—weighted tank-type accumulator; 1—Fuller Company 2-stage 60 h.p. rotary air compressor; 1—single pocket, 3'10" x 5'4" wash wheel plus new shell; 1—gas vulcanizer oven and burner; 2—air cylinder presses; Ass't-size tumblers, work tables, etc. Write or phone for detailed description and prices. IDEAL RUBBER PRODUCTS CO., 273-299 Van Sinderen Ave., Brooklyn 7, N. Y. DIckens 6-7100.

FOR SALE: FARREL 3-ROLL CALENDER, 24" x 48", EXTRA-heavy duty. 100 h.p. 220-V.D.C. variable. New, can be seen running . . . . OPEN FOR OFFERS. 30" x 12" 2-roll mill, new '46 . . . . . $4,000. Clayton steam generator 50 h.p. New '48 . . . . . . $2,950. Robinson 50 h.p. stock grinder, new . . . . . $3,000. Coulter #3A blanking machine. For sole and heel . . . . . $4,500. Address Box No. 929, care of INDIA RUBBER WORLD.

For Your

RUBBER MACHINERY

Buys of the month . . . . .

MILLS
16" x 40"
17" x 45"
22" x 48" heavy-duty
10" x 24"
20" x 22" x 60" (almost new)
20" x 24" x 36" Cracker, heavy-duty

CALENDERS
24" x 66" Farrel, three-roll
15" x 40" Farrel, three-roll
12" x 30" Four roll, late type (2 avail.)

MISCELLANEOUS
#2 National Tube Press
#3 National Tube Press
Giant Tire Chopper
Hydraulic Pumps

PRESSES
36" x 36", 2 open. 18" ram
48" x 48", 6 open. 4 8" rams
30" x 30" 2 open. 10" ram (several)
14" x 14", 8" ram
20" x 20", 10" ram

MISCELLANEOUS
3¼" Extruder
4½" Extruder
6" Extruder
8" Extruder
12" Extruder
L-2 Scott Tester
#9 Banbury Body
3A Banbury Complete
66" calender rolls
Mill rolls, all sizes available

and many more good pieces of equipment for rubber processing.

Let us know what equipment you may have available that is not being used, and for very little you may be able to exchange it for additional late type machinery that you require at this time.

AKRON RUBBER MACHINERY CO.

P.O. Box 88 Phone WAlbridge 1183-4 Akron, O.

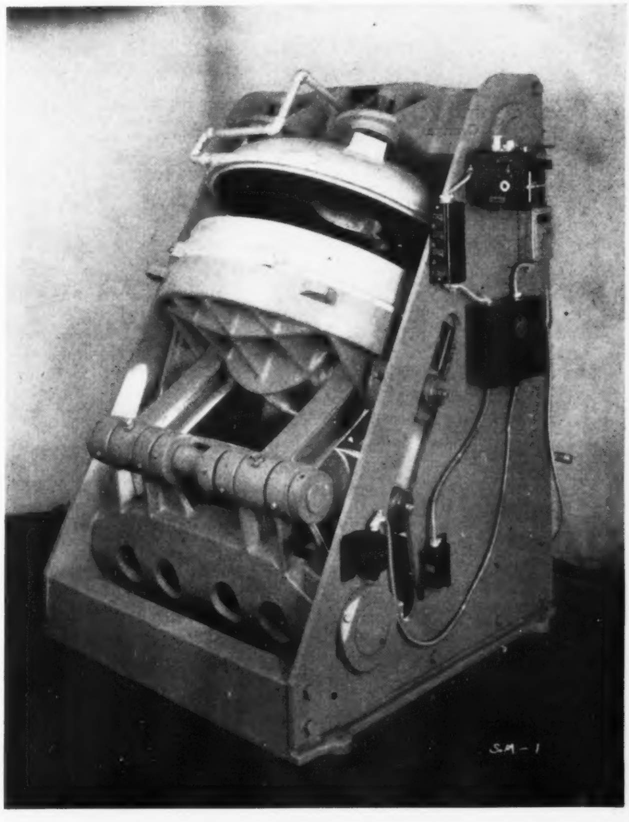
SUMMIT TUBE CURING PRESSES

10 — Summit Mold Division tube vulcanizing presses. See actual photo — right. These units develop 110,000 lbs. or 55 net tons and are driven by 5 H.P., 220/440 Volt torque motors complete with all controls, timers, and cycle setting devices. Presses are completely rebuilt. Bargain price for quick sale.

STEWART BOLLING & COMPANY INC

3190 East 65th St., Cleveland 27, Ohio

Tel. MIchigan 1-2850



(Classified Advertisements Continued on Page 385)

Dutch Boy DS-207	lb.	$0.55	$0.57
Dyphos	lb.	.5875	.6075
Dythal	lb.	.415	.435
Normasal	lb.	.475	.495
Plumb-O-Sil A	lb.	.3025	.3225
B	lb.	.3175	.3375
C	lb.	.3425	.3625
Tribase	lb.	.2825	.3025
E	lb.	.245	.265
Stabelans	lb.	.60	1.70
Stabilizer #3, #52	lb.	2.10	2.20
#143	lb.	.80	.90
B-5	lb.	.70	.75
BC-12	lb.	.90	.95
CH-14	lb.	.65	.70
E-6-B	lb.	.90	1.00
JCX	lb.	.67	.76
L Paste	lb.	.60	.65
SN	lb.	.47	.53
V-I-N	lb.	.42	.50
Dry Powder	lb.	.75	.80
V-9	lb.	.85	.90
VL-2	lb.	1.26	1.32
-3	lb.	1.17	1.23
Vanstay H	lb.	.75	.77
L	lb.	.33	.35
Witco Lead Stearate #50	lb.	.5025	
Stabilizer #70	lb.	1.25	

Colors

Black

Black Paste #25	lb.	.22	.40
BK Iron Oxides	lb.	.1175	.12
Covinylblaks	lb.	.62	1.14
Lampblack, comml.	lb.	.16	.45
Superjet	lb.	.0825	.1175
Mapico	lb.	.1175	.12
MB Mineral Blacks	lb.	.0315	.0675
Stan-Tone	lb.	.45	1.20

Blue

Du Pont	lb.	1.77	4.55
Heveatex pastes	lb.	.80	1.45
Stan-Tone	lb.	1.55	1.60
Toners	lb.	.30	3.50

Brown

Brown Paste #5, #10	lb.	.35	.45
Mapico	lb.	.1275	.13
Tan	lb.	.1975	.20
Metallic brown	lb.	.035	.045
Plastics brown	lb.	.0625	.07
Sienna, burnt	lb.	.12	.1625
Raw	lb.	.075	.1225
Umber, burnt	lb.	.0625	.065
Raw	lb.	.10	.1025

Green

Chrome	lb.	.95	1.20
Oxide	lb.	.375	.445
Du Pont	lb.	1.50	3.20
G-4099, -6099	lb.	.34	.345
-7599	lb.	.405	.41
GH-9869	lb.	.85	1.00
9976	lb.	.95	1.10
Heveatex pastes	lb.	.95	1.85
Stan-Tone	lb.	1.75	4.60
Toners	lb.	.35	4.00

Orange

Du Pont	lb.	2.75	
Orange Paste #13	lb.	1.35	1.50
Stan-Tone	lb.	.79	3.35
Toners	lb.	.30	1.50

Red

Antimony trisulfide	lb.	.72	.78
R. M. P. No. 3	lb.	.72	
R. M. P. Sulfur Free	lb.	.78	
Cadmium red lithopone	lb.	1.70	2.10
Cadmolith	lb.	1.72	2.05
Du Pont	lb.	1.32	1.80
Indian Red	lb.	.1225	.125
Iron oxide, red	lb.	.0225	.125
Mapico	lb.	.1225	.125
Red Paste #17, I-2	lb.	.95	1.10
Rub-Er-Red	lb.	.0975	
Stan-Tone	lb.	1.05	4.05
Toners	lb.	.25	4.15

White

Antimony oxide	lb.	.445	.46
Burgess Iceberg	ton	50.00	
Lithopone, titanated	lb.	.10	.11
Cryptone BT	lb.	.10	.11
Titanium pigments			
Rayox LW	lb.	.195	.205
R-110	lb.	.215	.225
Ti-Cal	lb.	.075	.0825
Ti-Pure	lb.	.195	.225
Titanox A-168,-LO,-MO	lb.	.21	.22
RA, RA-10	lb.	.23	.24
RCHT	lb.	.08	.085
Zopaque	lb.	.21	.22
Zinc Oxide, comml.	lb.	.176	.2085
Azo ZZZ-11, -44, -55	lb.	.176	.186
66	lb.	.1985	.2085
35% leaded	lb.	.1815	.1915
Eagle AAA, lead free	lb.	.176	.186
5% leaded	lb.	.176	.186
35% leaded	lb.	.1815	.1915
50% leaded	lb.	.1835	.1935
Florence Green Seal	lb.	.1935	.2035
Red Seal	lb.	.1885	.1985
White Seal	lb.	.1985	.2085
Horsehead XX-4, -78	lb.	.176	.186
Kadox-15, -17, -2	lb.	.176	.186
-25	lb.	.1985	.2085

Lehigh, 35% leaded	lb.	$0.1815	$0.1915
50% leaded	lb.	.1835	.1935
Protax-166, -167	lb.	.176	.186
St. Joe, lead free	lb.	.176	.186
Standard, 5% leaded	lb.	.176	.186
Zinc sulfide, comml.	lb.	.253	.263
Cryptone ZS	lb.	.253	.263

Yellow

Cadmium yellow lithopone	lb.	1.32	
Cadmolith	lb.	1.29	1.37
Chrome	lb.	.32	
Du Pont	lb.	1.62	2.15
Iron oxide, yellow	lb.	.10	.1025
Mapico	lb.	.10	.1025
Stan-Tone	lb.	1.00	1.55
Toners	lb.	.50	1.37
Yellow D	lb.	1.25	1.35

Dispersing Agents

Darvan Nos. 1, 2	lb.	.22	.30
Kreelons	lb.	.15	.16
Modicols	lb.	.17	.58
Triton R-100	lb.	.12	.25

Dusting Agents

Extrud-o-Lube conc.	gal.	1.84	
Glycerized Liquid Lubricant, concentrated	gal.	1.48	
Lubrex	lb.	.25	.30
Mica	lb.	.07	.0775
Polymel D-Tac	lb.	.21	.22
Pyrax A	ton	13.50	
W. A.	ton	16.00	
Snow Crest Talc	ton	33.00	35.00
Vanfre	gal.	2.00	2.50

Extenders

Advagum 1098	lb.	.61	.69
B. R. S. 700	lb.	.0175	.026
B. R. T. No. 7	lb.	.0265	.0275
Burgess MX-50	ton	150.00	
Dielex B	lb.	.06	
Factice, Amberex	lb.	.29	.36
Brown	lb.	.1425	.268
Neophax	lb.	.157	.268
White	lb.	.144	.285
Mineral Rubbers			
Black Diamond	ton	38.00	40.00
Extender 600	lb.	.185	
Hard Hydrocarbon	ton	46.50	48.50
No. 38	ton	38.00	40.00
Parmr	ton	21.00	29.00
Nuba No. 1, 2	lb.	.0575	.0625
3X	lb.	.0775	.0825
Polymel Sublac Resins	lb.	.26	.30
Rubber substitute, brown	lb.	.137	.2625
White	lb.	.156	.292
Stan-Shells	ton	35.00	73.00
Synthetic 100	lb.	.41	

Fillers, Inert

Barytes, floated, white	ton	37.60	61.75
Off-color, domestic	ton	19.00	20.00
No. 1	ton	37.60	53.60
2	ton	35.60	51.60
Blanc fixe	ton	90.00	130.00
Clays			
Albacar	ton	50.00	55.00
Aluminum Flake	ton	16.00	22.00
#5	ton	21.00	
Champion	ton	14.00	
Crown	ton	14.00	33.00
GK Soft Clay	ton	11.00	
Hi-White R	ton	13.50	33.00
Hydratex R	ton	28.00	
Paragon	ton	13.50	31.50
McNamee	ton	13.50	
RX-43	ton	33.00	
Stan-Clay	ton	28.00	
Stellar-R	ton	50.00	
Suprex	ton	14.00	33.00
W-1291 English	ton	53.00	55.00
Witco #1	ton	14.00	30.00
#2	ton	13.50	30.00
Cryptone BA, CB, MS	lb.	.08	.0825
Flocks			
Cotton, dark	lb.	.095	.112
Dyed	lb.	.55	.60
White	lb.	.13	.33
Fabrifil X-24-G	lb.	.095	
X-24-W	lb.	.135	
Filfloc 6000	lb.	.16	
F-40-900	lb.	.105	
Solka-Floc	lb.	.07	.16
Kalite	ton	50.00	65.00
Lithopone, comml.	lb.	.075	.085
Albalith	lb.	.079	.089
Astrolith	lb.	.06¾	.0675
Eagle	lb.	.0725	.075
Sunolith	lb.	.079	.089
Mica	lb.	.07	.0775
Millical	ton	32.50	47.50
No. 1 Silica	ton	22.00	40.00
Non-Fer-Al	ton	25.00	40.00
Purecal D	ton	50.00	65.00
M	ton	45.00	65.00
T	ton	110.00	125.00
Pyrax A	ton	12.50	
W. A.	ton	15.00	
SL Slate Flour	ton	17.00	25.00
Stan-White	ton	8.50	9.45
Super-White Silica	ton	23.00	42.00
Suspenso	ton	30.00	45.00
Terra Alba 1319	ton	27.00	
Ti-Cal	lb.	.0675	
Whiting, limestone	ton	$6.00	$15.00
Calcite	ton	20.00	
Paxinosa	ton	10.00	18.00
Witco	ton	8.50	

Finishes

Black-Out	gal.	4.50	8.00
Flocks			
Cotton, dark	lb.	.095	.112
Dyed	lb.	.55	.60
White	lb.	.13	.33
Rayon, colored	lb.	.90	1.50
White	lb.	.75	1.25
Rubber lacquer, clear	gal.	1.00	2.00
Colored	gal.	2.00	3.50
Shoe varnish	gal.	1.45	
Talc	ton	14.00	35.00
Nytals	ton	25.00	36.00
Wax, Bees	lb.	.63	.81
Carnauba	lb.	1.02	1.28
Montan	lb.	.14	.32
No. 118, colors	gal.	.86	1.41
Neutral	gal.	.76	1.31
Van Wax	gal.	1.45	1.50

Latex Compounding Ingredients

Accelerator 552	lb.	1.80	
J-127, -132	lb.	1.00	1.15
Aerosol	lb.	.35	
Agerite Dispersions	lb.	.60	2.25
Alcogum AX-10	lb.	.085	
Amberex Solutions	lb.	.1675	.18
Antifoam J-114	lb.	3.25	3.45
P-242	lb.	.24	.35
Antioxidant J-105	lb.	1.90	2.05
-126, -139	lb.	1.45	1.60
-137, -140	lb.	.55	.70
-138	lb.	1.05	1.20
-191	lb.	1.10	1.20
Anti-WebbingAgent X-452	lb.	.75	.90
Aquablaks	lb.	.0725	.187
Aquarex D	lb.	.80	
L Paste	lb.	.94	
MDL Paste	lb.	.33	
ME	lb.	.97	
NS	lb.	.60	
SMO	lb.	.50	
WA Paste	lb.	.28	
Areskap 50	lb.	.30	.38
100, dry	lb.	.60	.72
Aresket 240	lb.	.30	.38
300, dry	lb.	.60	.72
Aresklene 375	lb.	.42	.57
Black No. 25, dispersed	lb.	.22	
Casein	lb.	.395	.45
Coagulant P-379	gal.	1.30	1.90
-392	gal.	1.55	2.15
CW-12	lb.	.85	
-37	lb.	.70	
Dispersed Sulfur No. 2	lb.	.10	.12
Ethyl Thiurad	lb.	1.00	
Factice dispersions	lb.	.26	.42
Gelling Agent P-397	lb.	.34	.37
Habuco Resin Emulsion			
#226	lb.	1.05	
2246	lb.	1.30	
2402, 2343	lb.	1.60	
Laton L	lb.	.075	.0775
Ludox	lb.	.1675	.1925
Marmix	lb.	.41	.48
Micronex, colloidal	lb.	.06	.07
Pip-Pip	lb.	2.25	
Pliolite Latex 150, 190	lb.	.32	.41
170	lb.	.37	.46
R-2 Crystals	lb.	2.20	
Resin Emulsion A-2	lb.	.16	.25
A-155TH	lb.	.195	.265
P-370	lb.	.125	.175
X-210	lb.	.12	.32
Resin V	lb.	.13	
Santomerse D	lb.	.44	.65
S	lb.	.13	.25
Setsit No. 5	lb.	.75	1.05
SPDX-GL	lb.	.95	
Stablex A	lb.	.80	1.10
B, G	lb.	.50	.95
K	lb.	.27	.35
P	lb.	.35	.50
T	lb.	.17	.22
Sulfur dispersions	lb.	.12	.25
Thiocarbanilide (A-1)	lb.	.48	.55
Zinc oxide, dispersed	lb.	.21	.34

Mold Lubricants

Aquarex D	lb.	.76	
L Paste	lb.	.85	
MDL Paste	lb.	.30	
WA Paste	lb.	.25	
Carbowax compounds	lb.	.29	.295
Colite Concentrate	gal.	.90	1.15
ELA	lb.	.80	
DC Mold Release Fluid	lb.	4.14	6.00
Emulsion Nos. 35, 35A, 35B	lb.	1.68	3.50
DC 7	lb.	6.20	6.80
G-E Silicone Mold Release			
Emulsions SM-33, -61	lb.	1.59	1.77
Fluid SF-92	lb.	3.70	4.22
Resin SR-02	gal.	7.00	7.50
Glycerized Liquid Lubricant, concentrated	gal.	1.48	
Lubrex	lb.	.25	.30
Lubri-Flo	gal.	10.00	12.050
Mold Paste	lb.	.25	
Monten Wax	lb.	.57	
Para Lube	lb.	.046	.048

CLASSIFIED ADVERTISEMENTS

Continued

MACHINERY AND SUPPLIES FOR SALE (Continued)

FOR SALE: 6 PELLET PRESSES, KUX MODEL 25 (21 PUNCH and 25 punch); Stokes D-3 and D-4. Read Co., 250-gal. heavy-duty double-arm sigma-blade jacketed mixers. PERRY EQUIPMENT CORP., 1424 N. 6th St., Phila., 22, Pa.

FOR SALE: FARREL 18" X 45", 16" X 48", AND 15" X 36", 2-ROLL rubber mills, also new lab. 6" x 12" & 6" x 16" mixing mills and calenders, & other sizes up to 84". Rubber Calenders. Extruders 1" to 3". Rotary cutters. Sargent 3-apron conveyer 6-fan rubber dryer. Baker-Perkins Mixers 200 & 9 gal., heavy-duty double arm. Impregnating Units. Large stock hydraulic presses from 12" x 12" to 48" x 48" platens, from 50 to 1,500 tons. Hydraulic pumps and Accumulators. Grinders, Crushers, Churns, Rubber Bale Cutters, etc. SEND FOR SPECIAL BULLETIN. WE BUY YOUR SURPLUS MACHINERY. STEIN EQUIPMENT CO., 90 WEST STREET, NEW YORK 6, N. Y.

BANBURY BODIES, FOR INTERCHANGE OR SALE: SIZES #9, #10W, and #11. Also available, Banbury parts for most sizes. We rebuild all sizes of Banburys and our "Pre-Plan" method saves your production time. Write for details. INTERSTATE WELDING SERVICE, Offices, Metropolitan Bldg., Akron 8, Ohio.

FOR SALE: JACKETED VULCANIZER 18 FT. LONG BY 5 FT. diameter. Quick-opening door on each end. Address Box No. 937, care of INDIA RUBBER WORLD.

FOR SALE: HYDRAULIC PRESS WITH SELF-CONTAINED pumping unit, 24" x 54" platens, also 4½-inch extruder with motor and drive. Address Box No. 938, care of INDIA RUBBER WORLD.

FOR SALE

Four (4) used six-pass Buffalo reclaim rubber hot air perforated flight type conveyor belt dryers, 42 feet long, 19 feet high, with 6 feet wide belts. Reply Box No. 935, c/o INDIA RUBBER WORLD.

(Classified Advertisements Continued on Page 387)

Rubber-Glo	gal.	$0.94	/ $0.97
Soap, Hawkeye	lb.	1.35	/ 1.45
Purity	lb.	.155	/ .165
Sodium stearate	lb.	.43	/ .44
Stearite	lb.	.095	/ .10
Vanfre	gal.	2.50	/ 3.00

Odorants

Alamasks	lb.	.75	/ 6.50
Curodex 19	lb.	4.75	
188	lb.	5.75	
198	lb.	6.75	
Rodo No. 0	lb.	4.00	/ 4.50
No. 10	lb.	5.00	/ 5.50

Plasticizers and Softeners

Akroflex C	lb.	.61	/ .63
Aro Lene #1980	lb.	.10	/ 12
Bardol	lb.	0.025	/ 0.035
639	lb.	.025	/ .0425
B	lb.	.0575	/ .06
Bondogen	lb.	.55	/ .60
BRC 20	lb.	.015	/ .016
30	lb.	.0115	/ .02
521	lb.	.019	/ .02
B. R. H. No. 2	lb.	.02	/ .029
B. R. S. 700	lb.	.0175	/ .026
B. R. T. No. 7	lb.	.0265	/ .0275
B. R. V.	lb.	.035	/ .0515
Bunarex Liquid	lb.	.0425	/ .0555
Resins	lb.	.065	/ .1225
Bunnatol G. S.	lb.	.40	/ 505
Butac	lb.	.125	/ .135
BxDC	lb.	.40	/ .41
Cabflex DI-BA	lb.	.42	/ .4475
-OA	lb.	.435	/ .4625
-OP	lb.	.40	/ .4275
Carbonex	lb.	.0325	/ .0375
664	lb.	.0375	/ .0425
645	lb.	.036	/ .0385
S	lb.	.0425	/ .0475
S Plastic	lb.	.041	/ .046
Chlorowax 40	lb.	.16	/ .17
Contogums	lb.	.0875	/ .111
Cumar EX	lb.	.0525	
MH	lb.	.065	/ .11
V	lb.	.0975	/ .1275
Dielex B	lb.	.06	
Dipolymer Oil	gal.	.33	/ .38
Dispersing Oil No. 10	lb.	.055	/ .0575
Duraplex C-50 LV, 100%	lb.	.25	/ .295
Dutrex 6	lb.	.025	/ .035
Galex W-100	lb.	.135	/ .1725
W-100D	lb.	.1325	/ .17
Gilsowax B	lb.	.09	/ .11
Good-rite GP-261	lb.	.40	/ .52
GP-263	lb.	.45	/ .585
Harflex 500	lb.	.45	/ .4775
Heavy Resin Oil	lb.	.0225	/ .0375
Hercolyn	lb.	.1112	/ .1347
HSC-13	lb.	.27	/ .30
Indonex	gal.	.11	/ .19
Morflex 100, 110	lb.	.425	/ .4525
200, 210	lb.	.7775	/ .805
Nebony resins	lb.	.04	/ .045
Nevillac	lb.	.28	/ .55
Neville R Resins	lb.	.13	/ .35
Nevinol	lb.	.20	
Nevoll	lb.	.025	/ .035
Nevtex resins	lb.	.11	/ .48
No. 1-D heavy oil	lb.	.055	/ .065
Palmalene	lb.	.15	
Panaflex BN-1	lb.	.185	/ .225
Para Flux, regular	gal.	.1925	/ .2125
No. 2016	gal.	.165	/ .24
2332	gal.	.11	
Para Lube	lb.	.046	/ .048
Para Resins	lb.	.04	/ .045
Paradene Resins	lb.	.065	/ .075
Peptizene #2	lb.	.90	
Pepton 22	lb.	.72	/ .75
Picco Resins	lb.	.13	/ .185
480 Oilproof Series	lb.	.18	/ .23
S. O. S.	gal.	.29	/ .34
Piccocizers	lb.	.04	/ .068
Piccolastic Resins	lb.	.1855	/ .34
Piccolyte Resins	lb.	.185	/ .25
Piccoumaron Resins	lb.	.07	/ .185
Piccovars	lb.	.145	/ .20
Piccovol	lb.	.025	/ .038
Pictar	gal.	.25	/ .30
Pigmentar	gal.	.041	/ .0655
Pigmentaroil	gal.	.041	/ .0655
Plastender S	lb.	.04	/ .0425
Plasticizer 35	lb.	.205	/ .24
36	lb.	.305	/ .34
42	lb.	.34	/ .40
B	lb.	.35	/ .45
DP-520	lb.	.435	/ .455
MT-511	lb.	.535	/ .565
ODN	lb.	.32	/ .37
PX series	lb.	.385	/ .75
SC	lb.	.61	/ .69
Plastogen	lb.	.0775	/ .08
Plastone	lb.	.22	/ .30
Polycizers	lb.	.40	/ .4775
Polymel 6	lb.	.07	/ .075
7	lb.	.14	
D Resin	lb.	.253	/ .24
Gilsowax B	lb.	.0925	/ .1025
Resin C-130	lb.	.195	/ .205
PT67 Light Pine Oil	gal.	.50	/ .60
101 Pine Tar Oil	lb.	.041	/ .0534
400 Light Pine Tar	lb.	.041	/ .0534
800 Med. Pine Tar	lb.	.041	/ .0534
R-19, R-21 Resins	lb.	.1075	
Reogen	lb.	.1325	/ .135
Resin C pitch	lb.	$0.02	/ $0.0285
R6-3	lb.	.38	/ .40
Resinex	lb.	.0325	/ .0375
L-4	lb.	.0225	/ .03
Rosin Oil, Sunny South	gal.	.58	/ .865
RPA No. 2	lb.	.75	
No. 3 RO	lb.	.49	
5	lb.	.57	
RSN Flux	gal.	.10	/ .19
Rubber Oil B-5	lb.	.0225	/ .0355
Rubberol	lb.	.2575	
Santicizer 107	lb.	.40	/ .4775
140	lb.	.3525	/ .43
141	lb.	.40	/ .4775
160	lb.	.33	/ .4075
Seedine	lb.	.1485	/ .1705
Softener #20	gal.	.10	/ .20
Solvenol	gal.	.50	/ .61
Special Rubber Resin 100	lb.	.1675	/ .2175
Staybelite Resin	lb.	.125	
Stearex Beads	lb.	.14⅞	/ .15⅞
Stearite	lb.	.095	/ .10
Syn-Tac	gal.	.33	/ .35
Synthol	lb.	.2475	
TR-11	lb.	.035	
Turgum S	lb.	.1075	/ .1175
Tysonite	lb.	.215	/ .2225
X-1 Resinous Oil	lb.	.021	/ .0275
XX-100 Resin	lb.	.0525	

Reclaiming Oils

Bardol	lb.	.025	/ .035
639	lb.	.025	/ .0425
B	lb.	.0575	/ .06
B. R. H. No. 2	lb.	.02	/ .029
B. R. T. No. 4	lb.	.0225	/ .0235
B. R. V.	lb.	.035	/ .0515
BWH-1	lb.	.14	
Dipolymer Oil	gal.	.33	/ .43
Dispersing Oil No. 10	lb.	.055	/ .0575
Heavy Resin Oil	lb.	.0225	/ .0375
LX-759	gal.	.16	/ .169
-774, -777	gal.	.23	/ .33
No. 1621	lb.	.025	/ .035
3186	gal.	.28	/ .295
Picco 6535	gal.	.25	/ .30
C-33	gal.	.215	/ .315
C-42	gal.	.23	/ .33
D-4	gal.	.27	/ .37
E-5	gal.	.25	/ .35
Q-Oil	gal.	.286	/ .36
PT 101 Pine Tar Oil	lb.	.041	/ .034
150 Pine Solvent	gal.	.44	/ .553
Reclaiming Oil #3186	gal.	.28	/ .385
-G	gal.	.25	/ .365
RR-10	lb.	.35	
S. R. O.	lb.	.015	/ .0225
Wilcor Nos. 111, 151	gal.	.26	/ .30
X-1 Resinous Oil	lb.	.021	/ .0275

Reinforcers, Other Than Carbon Black

BRC 20	lb.	.015	/ .016
30	lb.	.0115	/ .02
521	lb.	.019	/ .02
Bunarex resins	lb.	.065	/ .1225
Calcene TM	ton	75.00	/ 95.00
Calco S. A.	lb.	.80	/ .83
Carbonex	lb.	.0325	/ .0375
644	lb.	.0375	/ .0425
645	lb.	.036	/ .0385
S	lb.	.0425	/ .0475
S Plastic	lb.	.041	/ .046
Clays			
Aluminum Flake	ton	23.50	/ 60.00
No. 5	ton	21.85	/ 36.00
22	ton	17.00	/ 22.50
Buca	ton	40.00	
Burgess Iceberg	ton	50.00	
Pigment No. 20	ton	35.00	
30	ton	37.00	
Polyclay	ton	45.00	
Catalpo	ton	30.00	
Crown	ton	14.00	/ 33.00
Dixie	ton	14.00	
Hydratex R	ton	28.00	
L. G. B.	ton	17.00	
Paragon (R)	ton	13.50	/ 31.50
Pigment No. 33	ton	30.00	
Suprex	ton	14.00	/ 32.00
Witco No. 1	ton	14.00	/ 30.00
No. 2	ton	13.50	/ 30.00
Clearcarb	lb.	.1175	/ .1225
Cumar EX	lb.	.0525	
MH	lb.	.065	/ .1175
V	lb.	.0975	/ .1275
G Resin	lb.	.08	
Good-rite Resin 50	lb.	.41	/ .44
Hi-Sil	lb.	.11	/ .12
Kralac A	lb.	.39	/ .50
Magnesium oxide	lb.	.05	/ .34
Marbon resins	lb.	.41	/ .48
Multiflex MM	ton	110.00	/ 125.00
Neville R Resins	lb.	.10	/ .155
Para Resins 2457, 2718	lb.	.04	/ .45
Pico Resins	lb.	.13	/ .185
Piccolyte Resins	lb.	.185	/ .25
Piccoumaron Resins	lb.	.07	/ .185
Piccovars	lb.	.145	/ .20
Pliolite, S-3, -6, -6B	lb.	.41	/ .48
S-6 Masterbatches	lb.	.42	/ .69
PS-60 Resin	lb.	.35	
Purecal U	ton	120.00	/ 135.00
Resin C Pitch	lb.	.02	/ .0285
Resinex	lb.	.0325	/ .0375
Rubber Resin LM-4	lb.	.28	/ .35
S-Polymers	lb.	.44	
Silene EF	ton	120.00	/ 140.00
L	ton	125.00	/ 145.00
Silvacons	ton	$55.00	/ $85.00
Super Multifex	ton	160.00	/ 175.00
Witcarb R	ton	105.00	/ 120.00
R-12	ton	45.00	/ 66.00
Zinc oxide, commercial†	lb.	.176	/ .2085

Retarders

Cumar RH	lb.	.105	
Delac J	lb.	.55	/ .60
E-S-E-N	lb.	.36	
Good-rite Vultrol	lb.	.58	/ .60
R-17 Resin	lb.	.1075	
Retarder ASA	lb.	.55	
PD	lb.	.34	/ .36
TCM	lb.	.65	
W	lb.	.43	
Retardex	lb.	.47	/ .50
RM	lb.	1.25	
Thionex	lb.	1.25	

Solvents

2 50-W Hi-Flash Solvent	gal.	0.41	
3-BX Naphtha	gal.	.37	
Bondogen	lb.	.55	/ 0.60
Cosols	gal.	.37	/ .48
Dichloro Pentanes	lb.	.04	/ .07
Dipentene DD	gal.	.47	/ .68
GVL	lb.	1.00	
LX-572 Oil	gal.	.27	/ .32
-748 Solvent	gal.	.16	/ .23
Penetrell	gal.	.47	/ .68
Picco Hi-Solv Solvents	gal.	.17	/ .24
Pine Oil D.D.	gal.	.755	/ .955
PT 150 Pine Solvent	gal.	.44	/ .55
Skellysolve-E	gal.	.153	
-H	gal.	.133	
-R, -V	gal.	.109	
-S	gal.	.099	
Tollac	gal.	.195	/ .25

Synthetic Resins

Geon Latices (dry wt.)	lb.	.43	/ .57
Paste Resins	lb.	.38	/ .59
Plastics	lb.	.42	/ .77
Polyblend	lb.	.475	/ .575
Polyvinol resins	lb.	.38	/ .70
Marvinol VR-10, -20	lb.	.36	/ .52

Synthetic Rubbers and Latices

Chemigum 30N4NS, 50N4NS	lb.	.50	/ .57
N1NS	lb.	.64	/ .71
N3NS	lb.	.58	/ .65
Latex (dry wt.)			
101-A, -AX, -E	lb.	.32	/ .41
200	lb.	.425	/ .525
235-A, -B	lb.	.50	/ .60
245-A, -B	lb.	.425	/ .525
G-E Silicone Rubber			
Compound SE-450	lb.	3.70	/ 4.10
-460	lb.	4.06	/ 4.46
Gum SE-76	lb.	5.00	/ 5.50
Hycar OR-15, -15EP	lb.	.58	/ .59
OR-15 Powdered	lb.	.621	/ .63
OR-25, -25 EP	lb.	.50	/ .51
OR-25 NS	lb.	.51	/ .52
OR-25 ST	lb.	.61	/ .62
OS-10	lb.	.55	/ .56
Hycar Latex (dry wt.)			
OR-15 types	lb.	.55	/ .60
OR-25 types	lb.	.47	/ .52
Neoprene Latex (dry wt.)			
Type 571, 842, 842-A	lb.	.35	/ .46
572, 700	lb.	.36	/ .47
601, 601-A	lb.	.38	/ .49
735	lb.	.36	/ .47
Neoprene Type AC, CG	lb.	.50	/ .53
E	lb.	.65	/ .68
FR	lb.	.80	/ .83
KNR	lb.	.75	/ .78
GN, GN-A, S	lb.	.38	/ .41
RT, W	lb.	.40	/ .43
Paracril 18-80	lb.	.43	/ .45
26NS60, 26NS90	lb.	.44	/ .46
35NS90	lb.	.51	/ .53
Paraplex X-100	lb.	1.00	
Silastic	lb.	2.35	/ 4.05

Tackifiers

Bunarex resins	lb.	.065	/ .1225
Chlorowax 70	lb.	.18	/ .19
Contogums	lb.	.0875	/ .11
Galex W-100	lb.	.135	/ .1725
W-100D	lb.	.1325	/ .17
Hercolyn	lb.	.20	/ .205
Indopol H-100	gal.	.85	/ 1.00
H-300	gal.	1.00	/ 1.16
Natac	lb.	.12	/ .13
Nevindene	lb.	.125	/ .155
Picco resins	lb.	.13	/ .185
Piccolastic resins	lb.	.1855	/ .34
Piccolyte resins	lb.	.185	/ .25
Piccoumaron resins	lb.	.07	/ .185
Staybelite Resin	lb.	.06	/ .065
Synthetic 100	lb.	.41	
Synthol	lb.	.2475	
Vistac #1	lb.	1.00	/ 1.16
A	lb.	.215	/ .2725
P	lb.	.18	/ .235

Vulcanizing Agents

Dibenzo G-M-F	lb.	2.50	
Ethyl Tuads	lb.	1.00	

CLASSIFIED ADVERTISEMENTS

Continued

MACHINERY AND SUPPLIES WANTED

WE ARE INTERESTED IN PURCHASING ALL TYPES OF RUBber machinery consisting of mills, Banbury mixers, extruders, calenders, vulcanizers, etc., and also complete plants. Address Box No. 930, care of INDIA RUBBER WORLD.

WANTED—TO EXPEDITE PRODUCTION—RUBBER MAKING machinery including Banbury Mixers, Heavy-Duty Mixers, Calenders, Rubber Rolls & Mixers, Extruders, Grinders & Cutters, Hydraulic Equipment, Rotary and Vacuum Shelf Dryers, Injection Molding Machines. Will consider a set-up plant now operating or shut down. When offering, give full particulars. P. O. Box 1351, Church Street Sta., New York 8, N. Y.

SMALL VULCANIZER 12" TO 18" DIAMETER BY APPROXImately 2 feet long. Tested for 40 lbs. operating pressure. ASSOCIATED RUBBER, INC., Quakertown, Pa.

WANTED: LARGE VULCANIZERS 10' DIAMETER OR LARGER. Address Box No. 931, care of INDIA RUBBER WORLD.

WANTED: 50-FT. HOSE MAKING MACHINE FOR VARIED diameters; submit all details regarding delivery, price, etc. Address Box No. 932, care of INDIA RUBBER WORLD.

WANTED: PELLETIZING FACILITIES FOR MOLDING RESIN or will purchase pelletizer. Address Box No. 936, care of INDIA RUBBER WORLD.

WANTED: 1—30", 2-ROLL RUBBER MILL WITH MOTOR & drive must be 220 V. Must be in good condition and located within 500 miles from Connecticut. NICHOLS ENGINEERING, 479 Ferry Blvd., Stratford, Conn.

BUSINESS OPPORTUNITIES

FOR SALE: SMALL MECHANICAL RUBBER MANUFACTURING company on Pacific Coast, active and financially sound, wishes to dispose of plant and business to parties experienced in same line of production. Address Box No. 928, care of INDIA RUBBER WORLD.

MANUFACTURING BUSINESS WANTED

We are now manufacturing over $20,000,000 in various lines and wish to expand by acquisition of assets or stock of one or more industrial companies. In our negotiations the sellers' problems and wishes will receive full consideration. Present personnel will normally be retained.
Address all replies "confidentially" C. J. GALE, Sec., 233 Broadway, New York 7, N. Y. BArclay 7-1819.

EXPERT MIXING AND CALENDERING

Rubber and GRS mixing and plastic compounding and calendering. All work done under careful supervision. Also precision grinding and pulverizing.

QUICK SERVICE

The Elm City Rubber Co.
73 Wallace Street, New Haven, Conn.
P. O. Box 1864 **Telephone 8-6152**

CUSTOM MIXING

We do milling and compounding of all types — blacks or colors — Master Batches —
All mixing done under careful supervision and laboratory control.

PEQUANOC RUBBER CO.
Phone: Butler 9-0400 **BUTLER, NEW JERSEY**

WANTED

Financially responsible organization will purchase complete sponge and mechanical rubber goods plant with presses, calenders, mills and extruders. Will consider all offers. Please give complete details first letter.
Address Box 555,
c/o INDIA RUBBER WORLD

SINCE 1880 — RUBBER & PLASTIC

Rand. REG. U. S. PAT. OFF

"They Last Longer" REG. U. S. PAT. OFF.

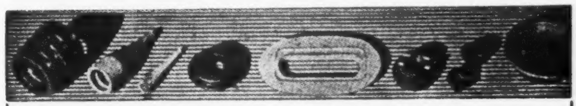
DRESS SHIELDS
DRESS SHIELD LININGS
BABY PANTS
BABY BIBS & APRONS
SANITARY WEAR
RUBBERIZED SHEETING
RUBBER APRONS
STOCKINET SHEETS
RUBBER SHEETS
RAINCAPES & COATS
RUBBER SPECIALTIES
DOLL PANTS, CAPES, ETC.
RUBBER DAM & BANDAGES — SHEET GUM

RAND RUBBER CO. BROOKLYN, N. Y. U. S. A. MFRS.

GRANULATED CORK

SOUTHLAND CORK COMPANY

P. O. BOX 868 — NORFOLK, VA.



INDUSTRIAL RUBBER GOODS

BLOWN — SOLID — SPONGE
FROM NATURAL, RECLAIMED, AND SYNTHETIC RUBBER

THE BARR RUBBER PRODUCTS CO. SANDUSKY OHIO

— WILL BUY —

Cancelled — Unshipped — Rejected
or Over-stocked

CHEMICALS — PIGMENTS — SOLVENTS
PLASTICIZERS — COLORS — OILS — WAXES, etc.

CHEMICAL SERVICE CORPORATION

80 Beaver St., New York 5, N. Y. — HAnover 2-6970

BRATEX Rubber Holland

3 STANDARD QUALITIES, 20 and 40 inch widths, 100 and 250 yard rolls. Special size rolls to order. Samples on request.

The Holliston Mills, Inc., Norwood, Mass.

AIR BAG BUFFING MACHINERY
STOCK SHELLS — **HOSE POLES**
MANDRELS

NATIONAL SHERARDIZING & MACHINE CO.
868 WINDSOR ST. — HARTFORD, CONN.
Representatives
Akron — San Francisco — New York

CONSULTANTS & ENGINEERS

BERLOW AND SCHLOSSER CO.
Consultation and Technical Service
Paper, Textile and Wringer Rolls—Mechanicals
Molded Specialties—Cut Rubber Thread
401 INDUSTRIAL TRUST BUILDING
PROVIDENCE 3, R. I.

FOSTER D. SNELL, INC.
Natural & Synthetic Rubber Technology
Compounding—Trouble Shooting—Testing
A personal discussion of your problems is suggested.
29 W. 15th St., New York 11, N. Y. — WA 4-8800

G-M-F-	lb	$.2.50		
Litharge, commercial	lb.	.21	/	$0.22
Eagle, sublimed	lb.	.2165	/	.2175
National Lead	lb.	.2165	/	.2175
Magnesium oxide	lb.	.05	/	.34
Genmag ML	lb.	.25	/	.26
Light #101	lb.	.195	/	.205
Medium	lb.	.14		
Methyl Tuads	lb.	1.10		
Red Lead, commercial	lb.	.2155	/	.248
Eagle	lb.	.2257		
National Lead	lb.	.2255		
Sulfasan R	lb.	1.50		
Sulfur flour, comml.	100 lbs.	1.70	/	2.20
Calco	lb.	.0195	/	.053
Crystex	lb.	.195		
Insoluble 60	lb.	.125	/	.13
Rubbermakers	100 lbs.	2.25	/	3.65
Stauffer	lb.	.0215	/	.0335
Telloy	lb.	2.50		
Vandex	lb.	3.50		
Vultac Nos. 1, 2	lb.	.45	/	.47
No. 3	lb.	.49	/	.51
White lead silicate	lb.	.1715	/	.2371
Eagle	lb.	.2204	/	.2371
National Lead	lb.	.1715	/	.1815

Foreign Trade Opportunities

The firms and industries listed below recently expressed their interests in buying in the United States or in United States representations. Additional information concerning each import or export opportunity, including a World Trade Directory Report, is available to qualified United States firms and may be obtained upon inquiry from the Commercial Intelligence Unit of the United States Department of Commerce, Washington, D. C., or through its field offices, for $1 each. **Interested United States companies should correspond directly with the concerns listed concerning** any projected business arrangements.

Export Opportunities

Trinidad Commercial Agencies, P. O. Box 627, 6 Henry St., Port-of-Spain, Trinidad, B.W.I.: plastic goods; toys and **novelties.**

Lenmore Agencies, P. O. Box 1155, Christchurch, New Zealand: rubber, rubberized fabric, rubber flooring; plastic mateials and hoses.

Märkische Kabelwerke A. G., Rauchstr. 22/27. Berlin-Spandau, Germany: waterproofed canvas covers, insulated varnish-covered wires, rubberized cables.

Fomag. Ltda., Av. Jiminez No. 8-56; Apartado Aéreo 3416, Bogota, Colombia: polystyrene and acetate cellulose molding compounds.

S. C. Heyerdahl, 6B, Tordenskjoldsgate, Oslo 12, Norway: synthetic rubber used in manufacturing tires, cables, and belting.

John C. Papaconstantinou, representing "Commercial-Industrial Co., Ltd.," 17 Third of September and Chalkokondvli Sts., Athens, Greece: tires, automotive spare parts.

Takis G. Vetopoulos, representing N. Polites & T. Vetopoulos, 4 Koral St., Athens, Greece: tires.

Klaus Oliven, Caixa Postal 2209, Porto Alegre, Brazil: **automotive parts, brake lining,** roller bearings, machinery for automotive shops.

D. W. Povey Sales Organization, 105 Shakespeare House, Commissioner St., Johannesburg, Union of South Africa: automobile body hardware, including window channeling and rubber supplies.

Lederfabrik Bogen, 261 Hunderdorferstrasse, Bogen/Ndb-Donau, Bavaria, Germany: rubber loom pickers.

Fred Bosche, c/o Cia. Azucarera Nacional de Nicaragua, Managua, Nicaragua: complete tire recapping unit.

Teofilo Reyes, Jr., representing Overland Automotive Distributors, 1651 Azcarraga, Manila, Philippines: automotive parts, batteries, tires.

Savo Mfg. Co. (Pty.) Ltd., Savotex House, 5-9 Crown St., Wolhuter, Johannesburg, Union of South Africa: molded rubber goods trimming machine.

Varney Agencies, 1206 Hamilton St., Vancouver, B. C., Canada: floor coverings, including rubber and plastic tiles.

Import Opportunities

V. S. Arendal, 35 Vesterbrogade, Copenhagen V, Denmark: slip prevention attachment for rubber tires.

A/S Merkantil Agentur, 5 Klingenberggaten, Oslo, Norway: rubber dish scrapers.

Zwick & Co., KG., Einsingen b. Ulm/Donau, Germany: testing machines for wood, metal, ceramic, rubber, and textile products.

Klebchemie G.m.b.H., Ebenhausen-Werk, bei Ingolstadt, Bavaria, Germany: adhesives.

Etablissements Fernand Viala, 12 Rue Negreneys, Toulouse, Taute-Garonne, France: corsets, brassieres, girdles, garter belts.

United States Rubber Statistics—August, 1951

(All Figures in Long Tons, Dry Weight)

	New Supply			Distribution		Month-End Stocks
	Production	Imports	Total	Consumption	Exports	
Natural rubber, total	0	*72,764	72,764	33,271	158	61,680
Latex, total	0	4,574	4,574	3,235	0	5,811
Rubber and latex, total	0	77,338	77,338	36,506	158	67,491
Synthetic rubbers, total	†68,501 ‡6,450	620	75,571	67,260	771	96,382
GR-S types	†62,820 ‡26	580	63,426	55,548	18	78,802
Butyl	†5,681	40	5,721	6,262	216	6,510
Neoprene§	‡4,935	0	4,935	4,332	394	7,077
Nitrile types§	‡1,489	0	1,489	1,118	143	3,993
Natural rubber and latex, and synthetic rubbers, total	74,951	77,958	152,909	103,766	929	163,873
Reclaimed rubber, total	29,035	140	29,175	28,598	991	43,900
Grand Totals	103,986	78,098	182,084	132,364	1,920	207,773

*Includes adjustment of +6,547 long tons applicable to prior months.
†Government plant production.
‡Private plant production.
§Includes latices.
Source: Rubber Division, NPA, United States Department of Commerce, Washington, D. C.

Estimated Automotive Pneumatic Casings and Tube Shipments, Production, Inventory, September, August, 1951; First Nine Months, 1951, 1950

	Sept. 1951	% of Change from Preceding Month	Aug. 1951	First Nine Months, 1951	First None Months, 1950
Passenger Casings					
Shipments					
Original equipment	2,104,689		2,356,325	21,204,451	27,637,363
Replacement	3,020,671		3,224,906	26,700,537	36,553,634
Export	79,837		53,244	512,551	425,894
Total	5,205,197	−7.62	5,634,475	48,417,539	64,616,891
Production	5,885,873	−2.24	6,020,860	48,983,206	59,315,892
Inventory end of month	3,617,900	+21.92	2,967,432	3,617,900	3,460,483
Truck and Bus Casings					
Shipments					
Original equipment	413,884		456,191	4,195,549	3,469,618
Replacement	946,447		1,004,823	7,745,840	7,185,920
Export	91,517		67,181	603,340	575,065
Total	1,451,848	−5.00	1,528,195	12,544,729	11,230,603
Production	1,543,469	+1.03	1,527,718	12,951,112	10,430,897
Inventory end of month	1,149,043	+7.88	1,065,074	1,149,043	913,884
Total Automotive Casings					
Shipments					
Original equipment	2,518,573		2,812,516	25,400,000	31,106,981
Replacement	3,967,118		4,229,729	34,446,377	43,739,554
Export	171,354		120,425	1,115,891	1,000,959
Total	6,657,045	−7.06	7,162,670	60,962,268	75,847,494
Production	7,429,342	−1.58	7,548,578	61,934,318	69,746,789
Inventory end of month	4,766,943	+18.21	4,032,506	4,766,943	4,374,367
Passenger (Including Motorcycle) and Truck and Bus Tubes					
Shipments					
Original equipment	2,522,230		2,809,437	25,424,195	31,100,480
Replacement	2,433,474		2,864,853	25,625,993	33,224,967
Export	113,657		86,608	670,818	541,369
Total	5,069,361	−12.00	5,760,898	51,721,006	64,866,816
Production	5,693,747	−7.25	6,138,854	50,545,347	59,629,622
Inventory end of month	6,833,736	+8.95	6,272,190	6,833,736	6,197,862

Note: Cumulative data on this report include adjustments made in prior months.
Source: The Rubber Manufacturers Association, Inc., New York, N. Y.

Phenol Plant for Canada

Canadian Kellogg Co., Ltd., a subsidiary of M. W. Kellogg Co. has been awarded a multimillion dollar contract for the construction of a phenol plant at Montreal, P.Q., by B.A.-Shawinigan, Ltd., a new company jointly owned by British American Oil Co. and Shawinigan Chemicals, Ltd. The new plant, said to be the first commercial unit of its type, is slated to produce 13,000,000 pounds of phenol annually. The plant will employ a process under license from Hercules Powder Co. and Distillers, Ltd. (London), by which cumene, a petroleum derivative, is oxidized to produce both phenol and acetone. Cumene will be piped from the Montreal refinery of British American Oil. Upon completion of the new plant, both phenol and acetone will be available for sale to Canadian industry and for export.

New Vulcanizing Agent

Sulfasan R, an organic sulfur-containing compound designed to replace elemental sulfur in natural and synthetic rubber furnace black stocks, is available in commercial quantities from Monsanto Chemical Co., St. Louis 4, Mo. The compound, 4,4'-dithiodimorpholine, was developed to reduce scorch or prevulcanizing which occurs in high modulus and high abrasion furnace black stocks when free sulfur is used as the vulcanizing agent.

The new product is said to delay the scorch time of furnace black stocks to twice or three times that of free sulfur at processing temperatures of 135° C., yet gives equally high modulus and tensile values at vulcanizing temperatures of 145° C., together with improved aging characteristics. The total sulfur content of rubber stocks containing Sulfasan R is less than half that required to obtain equivalent cured physical properties when free sulfur is used; i.e., 0.7-1.0% sulfur equivalent in Sulfasan R is equal to 2.5% free sulfur.

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